



APR 1 1938

Manufacturers Record

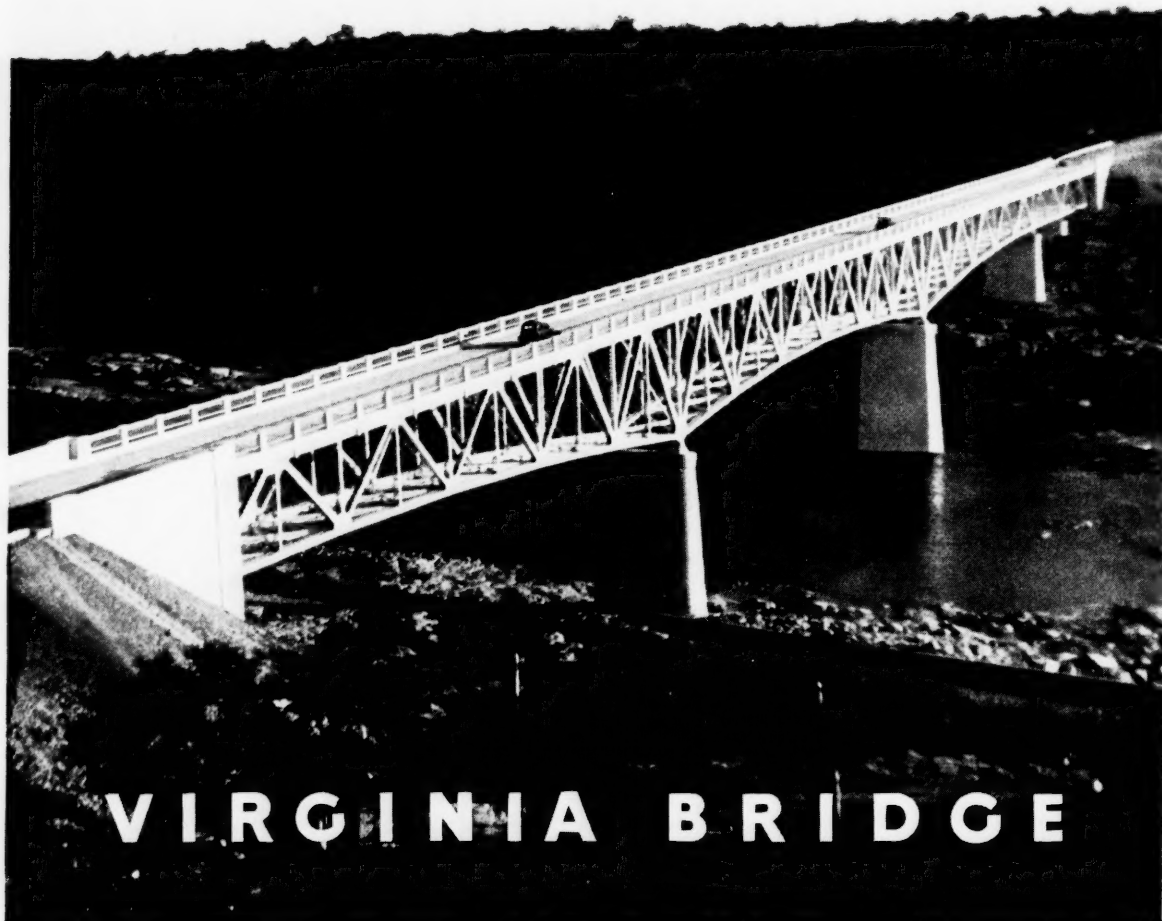
REFERENCE
DO NOT LOAN

THE CHOCKS

Who are the few that
are holding back
prosperity?

Remove government
obstacles and busi-
ness will proceed.

April
1938



Bridge over Colorado River, Burnet County, Texas.
Main steelwork is 894 feet long, consisting of 2—
79-foot spans and 1—736-foot continuous span

Steel Structures

THE PLUS OF STEEL Present-day Steel Construction does more than provide safe, dependable and lasting crossings for our rivers and chasms. It combines graceful design and pleasing looks at costs thoroughly economic.

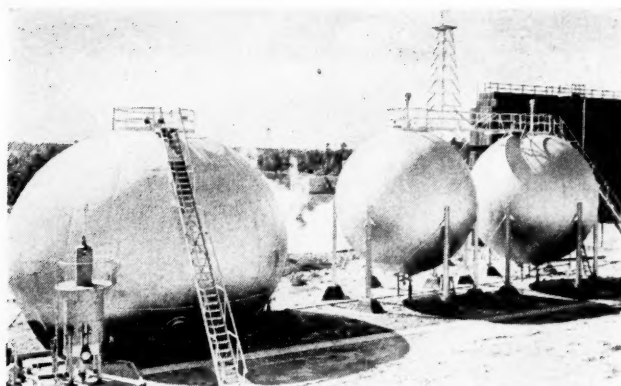
This bridge at Marble Falls, Texas, for which we manufactured and erected the steelwork is something of which any state would be proud.

VIRGINIA BRIDGE COMPANY
Roanoke Birmingham Memphis Atlanta
New York Dallas El Paso

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**APRIL
1938**

Volume CVII No. 4



Butane tanks at Gregg, Texas, built by Chicago Bridge & Iron Company

MANUFACTURERS RECORD

Devoted to the Upbuilding of the
Nation Through the Development
of the South and Southwest as the
Nation's Greatest Material Asset

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BLUE BOOK OF SOUTHERN PROGRESS**

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COVER ILLUSTRATION—Removing the chocks preparatory to launching the
Gulfdisc, built by Bethlehem Shipbuilding Corp. for Gulf Oil Corp. at
Sparrows Point, Md.

APRIL NINETEEN THIRTY-EIGHT

5



SALT for your table—cast iron pipe for your underground mains—nothing takes their place. Both are basic and indispensable as they have been for centuries. Both are better products today than they were 20 years ago.

If you demand *proved* long life and low maintenance cost that result from effective resistance to corrosion—assured safety margins for impact, beam load and crushing stresses—with permanently tight joints—then you will agree that *nothing takes the place of cast iron pipe*. Some materials meet some of these requirements but only cast iron pipe meets them all.



Look for the "Q-Check" registered trade mark.
Cast iron pipe is made in diameters from 1¼ to 84 inches.

THE STANDARD MATERIAL FOR UNDERGROUND MAINS



Putting down a cast iron water main to serve for a century. Original cast iron mains are still in service in more than 200 cities.

THE CAST IRON PIPE RESEARCH ASSOCIATION, THOMAS F. WOLFE, RESEARCH ENGINEER, 1015 PEOPLES GAS BUILDING, CHICAGO, ILLINOIS



STOP THE WASTE

THE opinion has been expressed in Washington that this is not a time to talk so much about balancing the budget as it is to consider ways and means to get the country out of the slump. No one will disagree with such a vital objective as getting the country started on the road to prosperity but the way in which this is done is not to be dismissed with a word.

Wasteful spending should be stopped. The way of spending as well as the amount need revision. If profligate spending is stopped, the budget will balance itself in the course of time.

We have spent billions to pave the way to prosperity and they have not worked. We have spent them without regard to receipts, without regard to the basic confidence necessary to provide receipts.

Venture money, as Lamont du Pont phrased it, is a spur to prosperity, the way to provide employment, but men are afraid to venture. While committees at Washington are trying to make borrowing easier, although lending agencies are loaded with funds, people are afraid to borrow, and the fact is overlooked that one of the surest means to inspire confidence would be the knowledge that economy is to be practiced and politics adjourned.

When one attempts to count the bureaus started in the last five years, the additions to the army of jobholders, or to catalog their objectives, criss-crossing and confusion and overwhelming expense become so apparent we have disturbing reasons why, instead of obtaining results, we are going through another depression. Almost every activity of life comes under the scrutiny and regulation of bureaucrats who are crowding the seat of government.

As we said a month or two ago, it is time to speak plainly. The time for mincing words has gone. Leadership is needed which will recognize facts and refuse to keep on dallying with foolish proposals which face disastrous results as soon as they are started. In the meantime, the complaint about taxes grows louder and it is becoming clearer that they must go much higher unless wasteful extravagance stops.

There are patriots in Congress who call attention to these things constantly but they are in the minority. There are also crack-brained theorists who will ruin the country unless they are stopped. There is a bottom to the well of America's wealth. It can't be drained constantly and regardless of the incoming supply of money.

The picture we are printing on the front cover of this issue shows men with sledges knocking out the chocks that have held back a ship until ready for the water. Business is straining at the chocks that are holding it back. Industry wants to go out into the sea of opportunity where, with half a chance, its ventures for the welfare of America will be more successful than ever in the past. In the meantime, the strength of its resources is being weakened by inactivity.

Business has been held up to opprobrium. Lambasted and accused of many crimes to catch votes, it has been denounced without regard to the terrible consequences of building up class hatred which has been the result.

Reorganization which puts more power in the hands of the executive and takes it away from the legislative branch is not the essential thing in the emergency. The kind of reorganization needed is the reorganization of our financial program that pays out more than it takes in, and the reorganization of the political objectives that seem to control our legislators. The temptation of continuing in office should be removed from those in high places. While plans are laid for another term the country suffers. Is there no such thing as disinterested, unselfish leadership, hewing to the line of common sense and economy and letting the chips fall where they may?

As we see it—

Get the Facts About TVA

At the cost of summary dismissal by the President as chairman of the TVA, a project in which he still declares his sympathetic interest, Dr. Arthur E. Morgan has rendered a decided public service in persistently stating that Congress is the only legitimately constituted body to investigate the manner in which this costly undertaking has been conducted. Only in the light of searching inquiry free of administrative control will it be possible to appraise the value of TVA.

While the MANUFACTURERS RECORD has not hesitated to criticize the TVA as a venture far removed from the proper functions of Federal Government and impossible of success as a yardstick for electric rates, there now appears additional reasons in the charges Dr. Morgan has made to investigate the whole set up from top to bottom—charges that are not mitigated in the least by Mr. Roosevelt's extraordinary inquiry.

So far as the yardstick is concerned of what price electricity, that is definitely out of the window. It is now well to find out if there has been gross incompetence or worse in the handling of two hundred millions of public money. Questions raised by the acting Comptroller General's 1937 report involving over \$10,000,000 still remain unanswered.

Let the whole matter be sifted to the bottom so that whatever corrective measures are needed, whether in the Board personnel or in changes of the Act itself, they may be known. It will be well to inquire too, what practical good has so far been accomplished to compensate for the vast sums expended. This remains to be proven. The investigation should not be limited to a narrow scope or be impeded by politics.

Why Not Longer Staple Cotton?

Among the contributory causes of the decline in American cotton and prices, are increased foreign production and improved quality of foreign cotton. Of the two, it is probable that quality has been the greater factor and it is somewhat ironical that this improvement has been brought about by importation of American seed.

The contention of our cotton farmers that staple length and grade is largely dependent upon climatic, insect and soil conditions, is no longer entirely tenable. The United States Bureau of Plant Industry has conclusively proved by its numerous cotton growing experiments at a variety of places throughout the South, that good quality long staple cotton can be grown under conditions virtually identical with those which produce poor quality short staple cotton.

Over a period of years there has been a slight improvement in American cotton, but with certain exceptions this has been due almost exclusively to the work of plant breeders. No better instance can be cited of our cotton growers disuse of high grade seed than that evidenced in the 1937 crop. A record breaking

yield produced under almost ideal conditions, yet the average staple length showed a material decline from former years and over ten per cent, or more than 2,000,000 bales are classed as untenderable because of the short staple length.

The astonishing thing being that growth of an uniform long staple crop will increase a cotton farmer's income from ten to twenty per cent for buyers pay as much as \$20 per bale more for the long varieties. Furthermore, as the Bureau points out, 15/16 inch and longer cottons can, in the majority of cases, be made to produce virtually the same amount of lint per acre as do the shorter staple varieties.

An Unjustified Bill

One of the things Congress can do to help the railroads is to bury the bill limiting the length of freight trains to 70 cars. The effect of it is bound to be to push back further the success of efforts railroads are making to get out of the red. Railroad men have testified to the fact that present day fast, dependable freight service will not be possible if the proposed measure is enacted.

One very practical view of the matter is that even with the present demands of traffic, additional sections would have to be put on to follow regular trains with the result of road and yard congestion and the further result of throwing back present fast schedules in the delivery of freight to consignees.

The extra expense, as stated by those competent to know, cannot be justified under the pretense of safety to employees or service to the public. The real purpose is to operate a greater number of trains to handle the same amount of traffic and to employ more people. The effect will be to make it more costly operation in general with not better service but less effective service.

It is time to consider what will be helpful to railroads and other businesses within reasonable limits and not go out of the way to enact legislation that, according to the practical evidence submitted, will be harmful in its effect. Because of the slump in business and for other reasons, the railroads are facing a critical situation. Their preservation in private hands for the business progress of America is of primary importance. They are fighting for their lives and they should be given such reasonable aid as can be given.

Improvement in Some Lines

"Construction," giving the contracts for March, presents figures for the South that are encouraging. The total of all contracts placed was over \$55,000,000 or 21 per cent ahead of the February total. While the contracts placed during the first three months of this year were 39 per cent less than for the same period of a year ago, general building is higher and road work is 39 per cent above the total of 12 months ago.

February exports are larger. The United States sold one hundred million dollars more abroad than it

As we see it—

(Continued)

bought during the month of February according to the figures released by the Department of Commerce. Lard, wheat, feed grains, feeds, metal working machinery, automobiles, aircraft and fertilizer are among the commodities sent abroad in larger volume for the month under consideration than they were the year previous.

It appears to be, for those who need homes, a good time to consider building. Interest rates, as well as facilities for borrowing, have never been so easy, while material prices will probably go higher before they go lower. The house shortage is marked and the construction industry can be, with any spurt in demand, a huge contributing factor to prosperity.

The road building business has been encouraged by the fact that states are being asked by Federal authorities to submit their programs so that allotments may be decided on at once. This is encouraging because it indicates that there will be no reduction in road building in which, as is well known, the largest part of the cost goes for labor.

While it is impossible to state with definiteness the exact time when business will move rapidly ahead, it seems safe to predict that the next movement is likely to be upward and when it starts in earnest, we should have, as Mr. Henry Ford and other competent observers believe, a great forward movement that will mark the beginning of a real cycle of prosperity.

Avoidable Blindness

The National Society For The Prevention of Blindness calls attention again to the fact that one of the principle causes of blindness in America is the eye hazard in industry. Every year hundreds of men and women lose their sight and thousands of others suffer through occupational accidents.

Aside from the humanitarian aspect, it is said industry in America could save 50 million dollars each year if known methods of eliminating eye hazards were scrupulously observed by all concerned.

The tragedy of blindness that might be prevented is the major consideration. It is accentuated now when there are very few jobs for blind men while so many able bodied men are unemployed.

The Society points out that the majority of accidents resulting in blindness can be prevented by providing protective equipment. This may be goggles and head masks for individual workmen; screens of metal, wood or canvas or glass shields at points of operation of machines which are attended by flying particles or splashing of molten metal or injurious chemicals. It is also possible to lessen the likelihood of accidents by the revision of the process of work or the redesign of tools and machines and their rearrangement. An important factor is to train and educate workmen and foreman in safe practices.

Safe guards to prevent, as far as possible, occurrences that to the individual may be irreparable are deserving of the careful thought of every plant owner.

Southern Opportunities

As the time draws near for the publication of the BLUE BOOK OF SOUTHERN PROGRESS, inquiries for the 1938 edition are increasing in number in every mail. They come from business men, institutions of learning, and research bodies in wide variety not only from the South but states of the North.

This is understandable when it is considered that interest has been increasing in the advantages the South holds for industry at a time when a large share of the thought of expansion includes decentralization. This is brought about because of mounting tax bills in industrial centers, as well as by disputes with labor.

A great deal has been written in the sensational press about the low wage rates of the South being used as an inducement to attract industry. It may be said without fear of controversion that such cases are marked by their scarcity. The right thinking people of the South want only the right kinds of industry, not those attracted by low wage rates. They want an industrial market for their agricultural products which are being diversified more every year. The progress of industry and agriculture must go hand in hand.

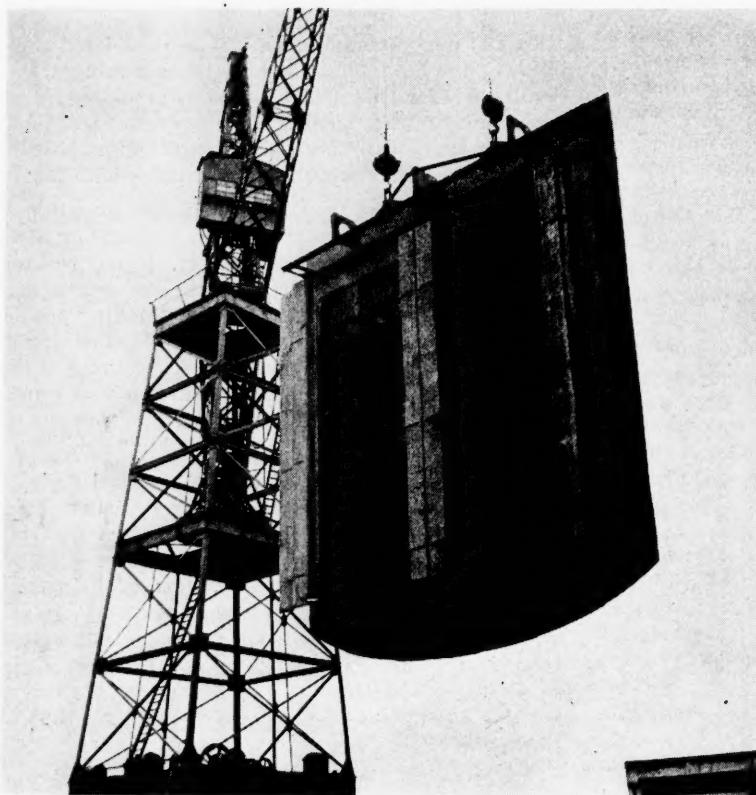
The South, characterized as the chemical and industrial frontier of the country with raw materials in abundance, offers a most promising field for industrial development and investment. Last year almost \$224,000,000 was invested in construction of industrial plants in the South while the total construction awards of more than \$810,000,000 were the second largest on record. It is estimated that of the expenditures in the last two years for industrial expansion in the United States, 55 per cent were for projects in the South.

The Blue Book presents authentic data not obtainable elsewhere, nor has there been in the years of its publication any source of information so replete with facts about a section described as the outstanding bulwark of our American civilization. The Blue Book of Southern Progress has proven indispensable to professional and business men alike. This year the scope of data included will be illustrated and enlarged to provide the most recent information regarding the principal industrial, agricultural and general business activities in the South.

The South's population is of American birth and American ancestry and, it may be added, with the greatest opportunity before it of any section. It will not only become the center of the chemical manufacturing industry of the United States, it is destined to be the center of other activities as business branches out in lines to contribute to the welfare of all.

The Blue Book of Southern Progress gives the record of what has been accomplished and a view of what is to come, based upon the bounty of nature and the resources of field and forest and mine.

Revival in Ship Building Brings Activity to Sparrows Point



A pre-fabricated 'thwartship bulkhead being lowered into its place in the hull

THE recent revival in the shipbuilding industry is vividly illustrated by the increasing activity at the Sparrows Point yards of Bethlehem Shipbuilding Corporation. Since December 1936 no less than six new tankers have slid down the ways at this plant. Four of these were built for the Gulf Oil Corporation and are approximately 11,250 tons deadweight capacity each.

The fifth vessel launched last year was the Esso Baton Rouge, the first of four 13,000 ton deadweight 13 knot tankers ordered by the Standard Oil Company of New Jersey. A sister ship, the R. W. Gallagher, was launched January 22, while the two remaining vessels of this group are under construction. Another large tanker is also on the ways at the present

time. This is being built for the Texas Company.

Contracts received since the beginning of the year insure continued activity for at least two more years. Standard Oil Company of New Jersey recently placed an order for three 16,300 ton deadweight tankers, designed to develop a speed of 18 knots, and incorporating other National Defense features required by the Navy for auxiliary vessels of this type. Other contracts awarded during the present year include two 16,100 ton tankers for Socony-Vacuum Oil Co., Inc., of New York, and a 13,000 ton tanker for Union Oil Company of California. This makes a total of nine ships to be completed.

The new Standard Oil tankers of the Esso Baton Rouge type follow in general

the customary arrangement for modern bulk oil carriers, with machinery and crew's quarters aft, and officers' accommodations and navigation spaces in a deck house amidships. The principal dimensions are as follows:

Length overall, 463 ft.; length between perpendiculars, 442 ft.; breadth, molded, 64 ft.; depth, molded, 34 ft., 10 in.; draft, 28 ft., 4 in.

The deadweight capacity is 13,000 tons, the carrying capacity, 106,400 barrels. Two longitudinal and seven transverse bulkheads divide the tank space into 24 compartments, each the full depth of the hold. Thus, if desired, as many as 24 different grades of oil may be carried at one time.

Forward, a dry cargo hold is provided, with a large hatch through the main deck, and below it a ballast tank, both separated from the cargo oil tanks by a cofferdam.

The cargo pumps are located aft, between the oil tanks and the machinery space. These are of the rotary type, electrically driven, and include two units of 2,800 gal. per min. capacity, and one unit of 1,000 gal. capacity. This is adequate for unloading the ship in less than 12 hrs. Pump room illumination is furnished by recessed lights behind vapor-proof glass windows, to provide the greatest possible protection against explosion hazards.

Probably the main point of interest in these vessels is the new structural design applied to longitudinals and bulkheads, developed by Bethlehem Shipbuilding Corporation, and used for the first time on these vessels. Increased deadweight, even stress distribution, ease of cleaning and greater resistance to corrosion are the main advantages gained by the use of this system.

In constructing the fluted bulkheads, each plate is pressed by machine in one operation, to give a trough-shaped section the long way of the plate about eight inches deep and 3 ft. wide. In the transverse bulkheads the fluting is vertical; in the longitudinal bulkheads the fluting runs fore and aft.

This fluting provides a stiffness that makes separate bulkhead stiffeners superfluous. The only extra support needed for the transverse bulkheads is three simple plate webs running across

the fluting. The longitudinal bulkheads are supported by the three transverses spaced at equal distances between each pair of transverse bulkheads.

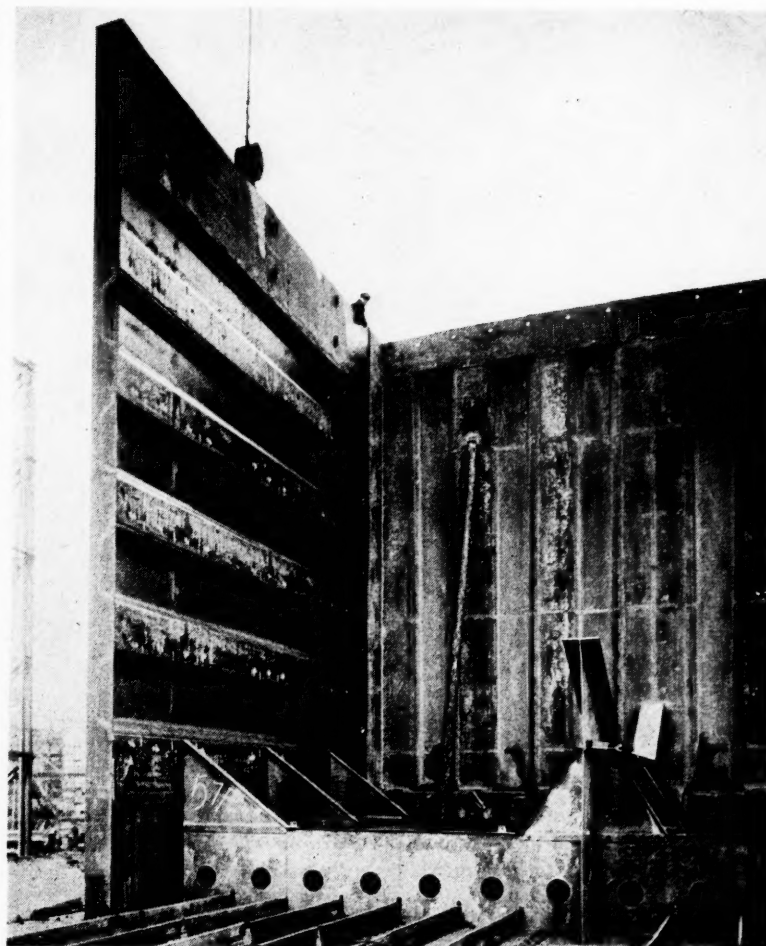
In this design the longitudinals are cut at the bulkheads, to simplify construction. A round bar type of connection was selected to carry the strength of the longitudinals across the bulkheads. This produces the effect of a continuous member of constant strength throughout the entire length of the cargo space.

This type of framing possesses great simplicity, ease of construction, and permits appreciable saving in weight without sacrifice in strength. Combined with the fluted bulkhead construction it makes possible considerable additional paying deadweight for a given displacement. The sloping sides of the fluting also insures a high degree of self-draining, while the smoother surface, of considerable area, facilitates cleaning and reduces corrosion.

With this new combination of framing and bulkhead construction it is also possible to use extra heavy scantling in sections particularly vulnerable to corrosion, thus minimizing repairs and prolonging the life of the vessel. As corrosion is a serious problem this is an important feature. However, the greater carrying capacity is still the most important advantage offered by this type of construction.

Ordinary transverse framing is used in both ends of the vessel, forward of the cargo tanks and in the machinery space and aft peak. Welding is used exclusively throughout the vessel, with riveting confined to the shell plating and upper deck plating amidships. Deck houses and enclosures are also of welded construction.

The propulsion machinery consists of a single four-blade screw installation, driven through reduction gears by one high pressure and one low pressure cross-compound turbine, designed and manufactured by Bethlehem Shipbuilding Corporation. This unit delivers 3,500 shaft horse powers at 85 r.p.m. Steam of 375 lbs. pressure at 725 deg. F. is produced in two oil burning Foster-Wheeler two-drum, water tube boilers with econo-



Part of ship's side and 'thwartship bulkhead showing details of fluted sheet construction

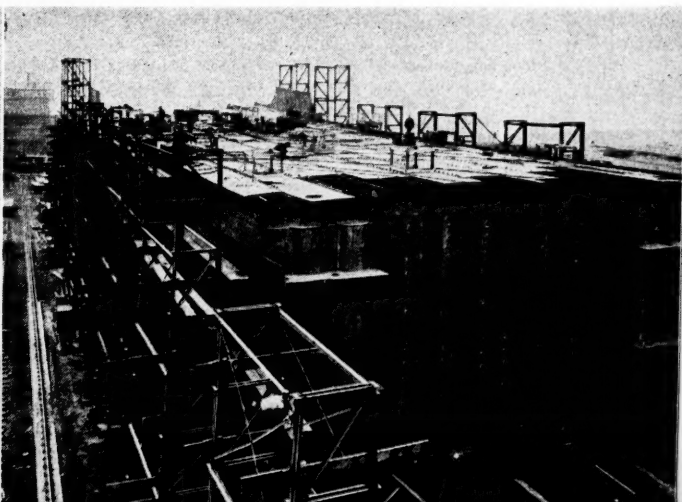
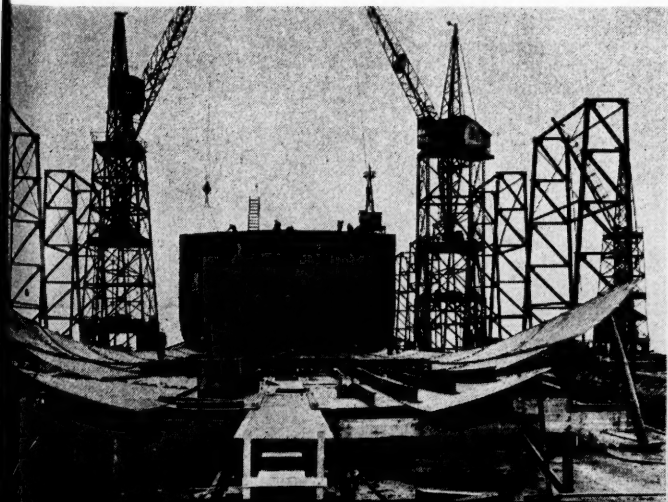
mizers, superheaters, and de-superheaters. Each turbine can be operated singly in case of emergency.

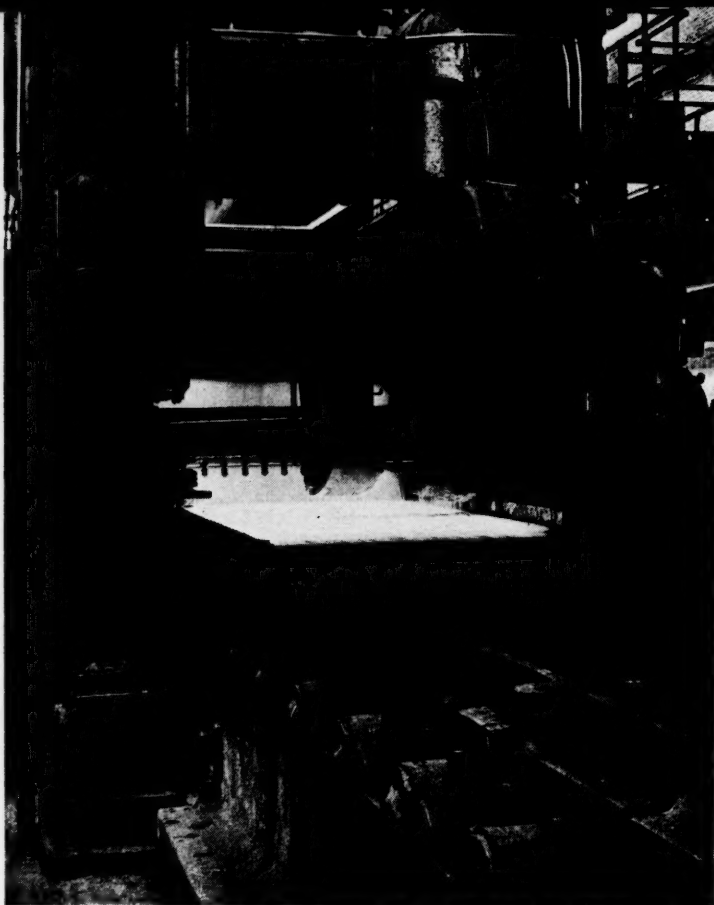
All navigation equipment is of the latest type. A Sperry gyro-compass with three repeaters is installed, in addition to the ordinary standard compasses. These ships are also equipped with Sperry gyro-pilot automotive steering control, a

fathometer and an electric sounding machine, as well as a continuous three day course recorder, helm angle indicators and electric revolution indicators. Among interesting safety devices are five independent radio receivers, an automatic S.O.S. receiver, radio direction finder, and complete radio communication equipment,

(Continued on page 56)

Left—The first plates and bulkhead are secured in place. Right—The hull nears completion, note the fluted bulkhead





A slab of steel entering one of the three hot mill roughing stands

THE new 98 inch continuous strip mill recently completed at Cleveland, Ohio, was formally opened last month by Republic Steel Corporation.

The nine buildings comprising the plant situated on a 182 acre tract necessitated moving the Cuyahoga river channel for a distance of half a mile. In doing this more than 1,000,000 cubic yards of dirt were excavated, over 19,000 concrete piles averaging 40 feet in length were driven into the new fill and 120,000 cubic yards of concrete were poured to provide a foundation for the superstructure and mill equipment. In addition to the nine buildings mentioned above, there is an office building with testing and metallurgical laboratories, a welfare building, machine shop, carpenter shop and a large pump house on the river bank. Altogether,

21 acres are under cover.

The mill equipment is integrated into the following seven processing units: 1. furnaces; 2. hot mill; 3. hot mill finishing; 4. continuous pickling; 5. cold mill; 6. annealing furnaces; 7. cold mill finishing. Slabs for the new strip mill come from Republic's nearby Corrigan, McKinney plant which has been enlarged to supply the necessary raw material. One of the four blast furnaces at the Corrigan, McKinney plant was increased to 1,000 ton and another to 800 ton capacity to provide additional pig iron. Eight soaking pits, in which ingots are heated before being rolled into slabs, were entirely rebuilt and a 40 inch blooming mill for rolling ingots was moved to make room for a 44 inch mill.

The hot mill consists of four roughing

Republic Steel's New Continuous Strip Mill

stands and six finishing stands weighing 450 tons each and standing 29 feet high. Each group of stands is preceded by a scalebreaker. In addition, there is a squeezer located between the first and second roughing stands.

The cold mill consists of three stands equal in size to those in the hot mill, while the annealing equipment comprises five batteries of four furnaces each, fired with natural gas of 1,000 B.T.U. The temperature inside the furnaces, which reaches a maximum of 1,350 degrees, is automatically controlled by electrical pyrometers. For the cooling of heated boxes there is a total of 55 cooling docks.

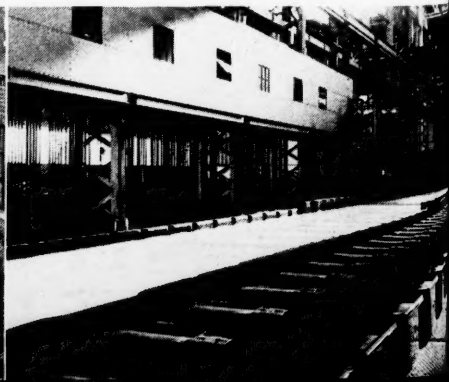
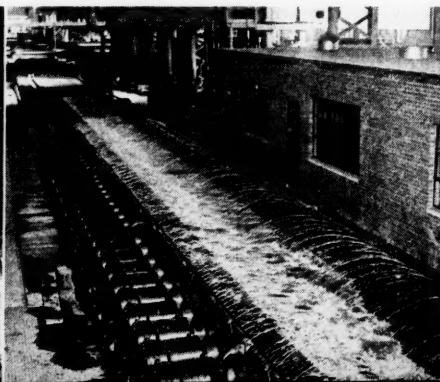
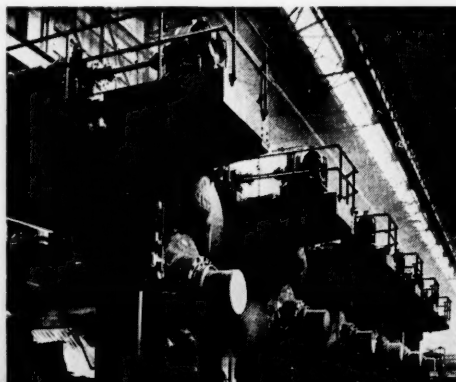
The new mill, with a nominal rated capacity of 70,000 gross tons per month, can roll sheets up to 94 inches at the rate of over 35 feet a second from the hot mill and at almost 14 feet per second from the cold mill.

In designing the mill, particular attention was paid to the protection and welfare of the men. Provision for locking out all controls when men are working in machinery, stairway instead of ladder approaches to all cranes, and walkways carrying men clear of all operations are just a few of the safety precautions.

Altogether, throughout the mill, there are 1,420 motors, with a total 123,000 horse power, varying in size from the so-called flea horse power motors to the five

(Continued on page 56)

Left—The train of six hot mill finishing stands. Center—The hot mill runout table with water spray to cool the sheet steel. Right—A 94-in. wide strip on the hot mill 278 motored runout table



Textile Fiber Derived from Milk

A new product of interest to the textile and dairying interests of the South

THE possibility of manufacturing on a commercial scale in this country, a synthetic textile fiber comparable to that of wool, is no longer an anticipation of the chemical laboratory.†

Since 1935 such a fiber has been produced in Italy and is now being manufactured in several other European and Asiatic countries under license of the Italian company. An attempt was made to sell the manufacturing rights in this country but for one or more of a variety of reasons, the matter was never consummated. Now it appears that while no patent rights have been granted so far in the United States, several applications have been filed including those of the U. S. Bureau of Dairy Industry, and several domestic firms have already produced fiber on a small trial scale.

Should the Federal application for patents be granted, the formula will be available to manufacturers in this country and the question will arise as to where the industry will be located. In this connection the Southern states may well consider the possibilities such production offers, for this region is essentially adapted to it.

The South is the textile center of the country where an abundance of skilled labor is available. The land retired from cotton growing can be put to no better use than the feeding of cows. This section is ideally adapted to dairying in all its ramifications and the problem of effective utilization of land heretofore in cotton will doubtless lead to more milk, more butter, more cheese, and why not casein*? In the meantime the soil is enriched, land value is increased, and money is kept at home that otherwise would go elsewhere.

In order to establish a basis for connected calculation, the following data have been obtained on the yearly requirements and production of an average cow. Three acres of land of average quality

will produce sufficient pasturage for a cow producing 4,000 pounds of milk per year. From this milk can be obtained enough cream to make 190 pounds of butter. The skim milk will yield 100 pounds of casein which, in turn, can be converted into 100 pounds of casein fiber. The whey remaining after the casein is extracted from the skim milk will contain 150 pounds of milk sugar and 20 pounds of albumin. These latter components have such slight commercial value at present that the most feasible use of the whey would be in the feeding of hogs or calves.

The process of converting casein into a textile fiber was first patented in

Germany by Dr. Todtenhaupt in 1904. His process consisted of dissolving casein in an alkaline solution and extruding this solution through fine openings into a precipitating bath containing acid, formaldehyde and alcohol, but was unsuccessful commercially, principally because the individual fibers stuck together and were brittle.

Antonio Ferretti's patent application covering the production of the casein fiber known as Lanital was filed in Italy, August 28, 1935 and in other countries in August, 1936. In November 1935, the first sample was presented officially to the

(Continued on page 58)

FEATURE ARTICLES IN COMING ISSUES OF THE MANUFACTURERS RECORD

Industrial Opportunities of the South

Commencing with the May issue, the MANUFACTURERS RECORD will present a series of maps and articles covering the material resources of the Southern states. Prepared by the editorial staff and embodying information not available in collective form elsewhere, the purpose is to portray in a concise, factual, and graphic way, the location by county of each state's major source materials for manufacturing; the various systems of transportation; and other pertinent details regarding agriculture, climate, electric power facilities, labor, and taxation. The first state will be Alabama with the others following in alphabetical order.

Railroad Purchases in the South

Another feature now in preparation by railroad statisticians, will be articles concerning the vast purchases made by the railroads—what they buy, where they buy it, and how much they spend in the various parts of the South.

The Oil Industry's Activities

Then there will be several articles written for the MANUFACTURERS RECORD by leading executives of the industry, about the South's oil, including: developments of refining and details of maintenance; petroleum by-products and their use; transportation of petroleum; and, the extent of our petroleum resources, what is being done as far as conservation is concerned and the possibility of discovering new sources both natural and manufactured.

Materials Handling

Still other articles will feature materials handling; plastics and chemicals in the South; and a series of articles designed to give factual information regarding the work that can be done to improve and modernize manufacturing plants in the South. These will include details about new machinery needed, suitable lighting, adequate housing of equipment and other up-to-date aids to high speed, low cost plant operations.

†Part of the information in this article was supplied by the Bureau of Dairy Industry, U. S. Dept. of Agriculture.

*Casein is one of the principal constituents of milk, procured by a factory process from skim milk after the cream has been extracted.

A Private Forest Enterprise

Extensive Timber Operations of the Alabama Power Company

IN connection with the development of its six large hydro-electric plants located on the Coosa and Tallapoosa rivers, Alabama Power Company acquired considerable acreage for the purpose of guarding riparian interest, construction and maintenance and to control land usage in the immediate vicinity of the reservoirs. Practically all of this land is of forest character; however a small amount is suitable for agriculture and is devoted to this purpose.

Prior to the time of acquisition, practically all of the commercial size timber had been removed. Annual woods fires and the grazing of cattle had interfered with the natural reforestation of certain areas. On some of the land formerly devoted to agriculture, the lack of a sufficient number of seed trees has resulted in the growth of thin stands of pine timber of little or no commercial value. However, the greater part of the land is covered with an excellent growth of young trees which, under adequate fire protection and management, will prove a profitable operation.

In order to formulate definite plans for economical and profitable management and to establish the various forms of control mentioned in the foregoing paragraphs, preliminary surveys and considerable experimental work has been in progress over the past few years. The State Commission of Forestry has cooperated in the survey work and many of their recommendations as to fire protection, management of timber lands on selective cutting plan, and suggestions regarding species to be planted, are incorporated in the present forestry program of the company.

In 1934 the company established the first forest plantations, consisting of two five acre tracts of slash pine in the Jordan and Martin Dam reservoirs in central Alabama. These plantings are now well established and have attained a height of 4 to 8 feet. During the same year a small pine nursery was established near Jordan Dam, and the planting program was gradually enlarged. The company now has 13 forest plantations established, ranging in size from 5 to 75 acres.

The planting program has been confined, for the most part, to the lands along the Coosa and Tallapoosa Rivers. Long-leaf, loblolly and slash pine trees make up a large proportion of the planting. A few locust and hardwood trees are planted to assist in fire control. Distribution of the various specie apart from the locust and hardwoods, is governed by suitability of the particular soil.

The slash pine has been favored mostly due to its rapid growth, but also because of its value as commercial timber and its adaptability to a wide range of soils. Long-leaf and loblolly, also of commercial value, have been found more desirable for planting dry ridges and hillsides. The slash pine has been used for the planting of bottom lands.

Plowed fire lanes, 20' to 30' wide, are usually utilized to protect the plantation from grass fires; however, on the more recent plantings, 50 foot strips of black locust were planted as fire breaks. Due to the rapid growth of black locust, it will quickly shade out the grass and should be an economical means of controlling grass fires.

Alabama Power Company has a fairly

well defined policy to pursue over a period of years. In general, this program calls for expansion in forest fire-detection, patrolling and suppression work; reforestation of idle lands, management of forests on a sustained yield basis and the incorporation of soil conservancy practices on all agricultural lands.

The State Forestry Commission recently completed a study of the Martin Dam Reservoir, with a shore line of approximately 700 miles, and submitted a plan that provides for a system of fire-detection together with patrol and fire-suppression work under the supervision of the Commission. The first step in this plan calls for the erection of an observation tower on Smith's Mountain on the east side of the lake and a patrol boat equipped with a pump and fire fighting equipment. At least two other towers, one on the west side of the lake and another near the northern limit of the area, will follow as soon as practicable. The system also calls for several patrolmen and, at times, stand-by crews, on a day basis, stationed at strategic points. This system is suitable to southern forests in general and, through cooperative agreement with the State Forestry Commission, landowners can construct and maintain the system for this area at a very moderate cost.

Early in 1937 Alabama Power Company established a new five acre forest nursery near its Mitchell Dam. Two acres are equipped with an overhead irrigation system supplied from a creek. Due to a late planting in 1937, some of the seed failed to germinate. In spite of this fact, approximately 50,000 loblolly, 50,000 long leaf, 175,000 slash pine and 20,000 black locust were successfully produced and transplanted in January of the current year. Providing the vagaries of germination, insect and other contributing factors of depredation do not interfere, it is hoped that 1,000,000 slash pine, 300,000 loblolly

(Continued on page 58)

Left—Abandoned farm lands covered with thin stand of loblolly pine 13 to 15 years old. Center—Planting seedlings on land retired from cultivation. Right—Natural growth longleaf and loblolly pine.



Southern States Industrial Council

IN the early and hectic days of NRA, southern business and industry, fearing that it might be excluded from proper representation on various code authorities, its favorable wage differentials threatened, realized that it did not have a single common competent agency to present its views and protect its legitimate interests—of this emergency The Southern States Industrial Council was born.

The Council is a non-profit corporation chartered under the general welfare laws of Tennessee, with its principal office at Nashville. At first its work was done largely by non-salaried industrialists, under the able leadership of John E. Edgerton, President of the Lebanon Woolen Mills. Members gave it such time as they could and contributed to its finances as their legitimate interests appeared in jeopardy. Its work, then, was, of necessity, largely to oppose unsound federal legislation. As time passed it became apparent that, to make effective its general objectives, a trained and expert staff, devoting all of its time to its work, with accurate factual data, was necessary. Gradually this was done.

Early in the present year the Council was, in part, reorganized on a more or less permanent basis. Any individual, any business, any non-political organization interested in southern industry and business is eligible to membership. There are no fixed dues; members contribute what they will. Its governing agency is made up of a Board of Directors—three business men from each southern state and the state of Missouri (whose problems are in large degree those of the South proper). This Board, in turn, selects an Executive Committee of nine to give active direction to its work. Prentiss M. Terry, formerly Treasurer of the University of Louisville, a man of large tal-



President
Fitzgerald Hall, President, N. C. & St. L. Rly., Nashville, Tenn.

ents and experience, was chosen as its salaried, full time, Executive Vice-President and, under the direction of the Executive Committee, is in complete charge of all of its work. Charles C. Gilbert (likewise Secretary of the Tennessee Manufacturers Association) was chosen as its Secretary and Assistant Treasurer. All other officers and directors serve without pay—for the good of the cause.

With the emergency which caused its creation diminishing the Council is undertaking a long range constructive program. It has rather definite views and objectives—subject to change, of course. These may be of general interest.

General Views

The Council, from time to time, has gone on record as to certain questions—

briefly summarized some of them are:

(1) The Council is wholly non-partisan and non-political. It seeks to impose the individual views of its officers and directors on none, but rather to act as a clearing house for the coordination and expression of the views of its members.

(2) It seeks to supplant none of the fine trade associations, chambers of commerce, and similar organizations; but hopes to work with them to the end that a complete and accurate composite of southern business views may find expression through one common channel.

(3) It seeks for the South no preferential treatment—it seeks to impose no burden on its friends in business elsewhere. What it hopes to do is to see to it that the facts relating to southern business, particularly to the extent differing from those obtaining elsewhere, may be accumulated, appreciated and understood, to the end that southern business may, at the hands of public authority and others, receive its just due—no more, no less.

(4) It believes in the American system of government—and wants that system perpetuated. If changes be in the public interest, it wants those changes made, not hastily, but after full public consideration in the orderly manner provided by the organic law of the Nation—not by legislative fiat or administrative edict.

(5) It believes in the wisdom and integrity of the American Judiciary and oppose any effort to subject our courts to the polluting influences of partisan politics.

(6) It opposes taxation save for legitimate public expenditures; believes in a balanced budget, local and national, by reducing governmental waste; it is opposed to the economically destructive undistributed profits tax; it believes in social

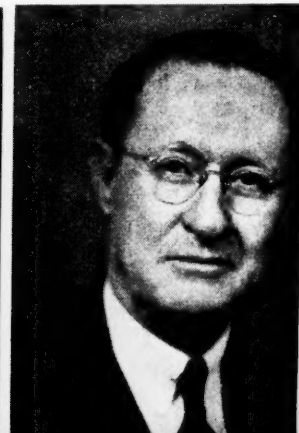
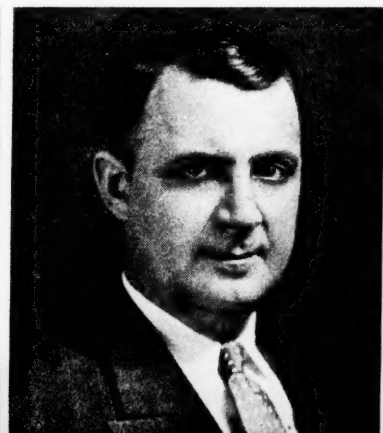
(Continued on page 60)

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Shale and underclay pits and plant of Southern Clay Mfg. Co., Scott County, Tenn.

Industrial Opportunities of Tennessee in its Ceramic Raw Materials

BY

George I. Whitlatch

*Associate Geologist
Tennessee Division of Geology
Nashville, Tennessee*

TENNESSEE'S best known ceramic resources are its high-quality pottery clays, as ball, wad, and sagger clays, but the State also has abundant, widely distributed resources of shales, underclays, loess, and similar lesser grade clays on which is based a substantial clay-working industry of more than 40 plants that annually produces a variety of wares exceeded by few, if any, other Southern States. Ground feldspar, and quartz, obtained from the famous Spruce Pine district of North Carolina, are also produced in Tennessee for the ceramic trade. In addition to these commercially used ceramic materials, the State has a number of other mineral resources, including bauxite, tripoli, silica sands, limestone, kaolin, barite, manganese, flint clay, bentonite, and dolomite, that are more or less adaptable to ceramic uses.

Within recent years the South has experienced substantial industrial growth which proves that the abundant natural resources of this area are capable of supplying local markets with many articles formerly made only in northern in-

dustrial centers. Many of the lesser-grade ceramic resources, for example, have been used in the manufacture of heavy clay wares, but only minor industrial use has been made of the higher-grade materials, as ball clay, kaolin, and feldspar. These materials could well be used in Southern plants for making several products, notably sanitarywares, but instead, the South annually ships the bulk of such raw materials to northern potteries and then buys back the finished wares at prices that include the charges for two long freight hauls and high manufacturing costs. The fallacy of this system of manufacture and distribution, however, is becoming apparent to the Southern consumer, and it seems certain that, within a relatively short time, additional potteries or ceramic industries will be established in the South where economic advantage can be taken of greater proximity to both raw materials and the consuming markets.

Tennessee has become one of the principal industrial States of the South largely because of its central location and wealth of natural resources; not the least important of these resources are its cheap fuel and power. In any future expansion of ceramic industries in the South, the abundant and varied ceramic resources of Tennessee, along with the other natu-

ral advantages, will cause it to receive serious consideration as a center for pottery or other ceramic manufacture.

The Clay Products Industry, Its Products and Its Clays

Tennessee's clay products industry, consisting of 42 plants widely distributed over 20 counties, is dominantly engaged in the manufacture of heavy clay wares; only 9 potteries are in operation in the entire State. In years of normal production, this industry produces finished wares valued at approximately \$4,000,000, of which more than one-fourth is due to pottery.

East Tennessee, mainly because of its abundant resources of clay and proximity to the coal-bearing areas of Cumberland Plateau, is the principal area of production and has a total of 28 heavy clay products plants, largely located in Daisy, Chattanooga and Knoxville. Shales of the Cambrian, Ordovician, Silurian, and Mississippian formations are the chief raw materials of this area, although alluvial clays of Tennessee and Holston Rivers are residual clays derived from shale and limestone formations contributing materially to the production. Mississippian shales of the Pennington formation, which occur in Walden Ridge, have been particu-

larly attractive to ceramic industries because of the cheap fuel available in nearby coal horizons.

Ceramic shales and underclays are relatively abundant in the Pennsylvanian formations of Cumberland Plateau. The Briceville shale and underclay of the Hooper and Coal Creek coal horizons are used here as mixtures by two plants for the manufacture of paving, face, and chemical brick and electrical conduits. The quantity and quality of raw materials in the Plateau, along with the available cheap coal, justify additional development; about eight underclay horizons and some four or five shale horizons are capable of yielding materials suitable for a variety of ceramic purposes, including stoneware or artware manufacture.

The list of heavy wares made by the East Tennessee plants from native raw materials is representative of every type of heavy ware made in the State and includes common, face, paving, and chemical brick, acid-tower rings, sewer pipe, wall coping, farm drain tile, hollow building tile, roofing, wall, and floor tile, electrical conduits, and turpentine cups. In addition to this production, two major potteries, at Knoxville and Erwin, respectively, make electrical porcelain and dinnerwares, but the only Tennessee materials used in these wares are ball clays.

Middle Tennessee is dominantly a limestone area and, therefore, limited in ceramic resources to residual and alluvial clays. Brick, chiefly commons, are the principal products of the area. Nashville, center of production, has three brick plants and a florist ware pottery, all based on the alluvial clays of Cumberland River. Bricks are made from residual clays by three other plants in this area, while three small stoneware potteries, based on residual clays, and one artware pottery are operating in Putnam County. The artwares are made from local under-



Mining ball clay at the Etheridge pit of Kentucky-Tennessee Clay Co., Henry County, Tenn.

clays, with which is mixed some plastic sedimentary clay imported from West Tennessee.

Although West Tennessee is noted for its production of high-grade pottery clays, this area has not developed any extensive clay products manufacture. Common and face brick, the chief products, are made of sedimentary clays at three widely separated plants; a small stoneware pottery at Paris also uses this type of clay. The remainder of operations in this area, consisting of three brick plants at Memphis and a farm drain tile plant at Union City, are using weathered clay derived from the loess deposit that mantles the westernmost third of West Tennessee.

The Clay Mining Industry of Tennessee

West Tennessee is justly famous for its production of high-grade ball, wad, sag-

ger, and other plastic clays which are annually shipped to all the principal pottery centers of the United States. These clays, sedimentary in origin, occur as lenticular lenses in sands of the Ripley (Cretaceous), Holly Springs, and Grenada (Tertiary) formations of that area; the bulk of current production is from the Tertiary formations. The principal centers of mining are Paris, Puryear, and Whitlock in Henry County; Dresden and Gleason in Weakley County; and McKenzie in Carroll County.

In 1936 the ball clay produced in this area alone amounted to over 27,000 tons or approximately 27% of the national output in that year.

In East Tennessee a siliceous residual clay of relatively high purity, derived from the Knox (Cambro-Ordovician) formations, is mined in a limited way at

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Spring stripping operations preparatory to mining ball clay, Crawford Pit, Ball Clay Co., Gleason, Tenn.



U. S. Exports Advance And Trade Balance Continues to Rise

A FOREIGN trade balance in favor of the United States, which has been constantly increasing since the upturn started about the middle of 1937, reached the highest point for several years during February of this year, according to the United States Bureau of Foreign and Domestic Commerce. Exports for the month of February totaled \$262,733,000 compared with \$233,125,000 in the corresponding month of 1937 and brought the total for 1938 to \$552,165,000, an increase of \$96,376,000 over the same period of 1937.

February imports were \$163,085,000, which, together with January brought the total imports for 1938 to \$333,810,000 as compared with \$518,153,000 in the corresponding months of 1937. February imports declined 41% (manufactured foodstuffs, 29%, and finished manufactures, 21%) while exports for the same month increased 13%.

Although agricultural exports increased heavily over February, 1937, with grain amounting to \$25,033,000, many agricultural commodities declined in value though the quantity increased. However, exports of manufactured goods have increased almost uniformly.

Notable Increase in

Machinery Exports

Exports of industrial machinery which in 1937 totaled \$253,608,539, the highest level since 1929 and over 49 per cent above the 1936 total, continued the pace in February with a gain of 58% in value, or \$23,631,261 compared with \$14,964,710 in February, 1937. Similarly, agricultural implement exports valued at \$75,366,103 in 1937 were 72% above the total for 1936 and were the highest since 1930. These latter had a total valuation of \$6,602,373 in February, a gain of 46% over the comparable month of 1937.

Iron and steel exports amounted to 203,850 gross tons valued at \$12,643,356 in comparison with 139,714 tons valued at \$9,734,132 in February, 1937, a gain of 46% in volume and 28.5% in value. Shipments in the first two months of the current year in reaching 433,607 tons valued at \$27,601,898 surpassed the January-February figures of the 1937 banner year by 61.5% in volume and 44% in value. Shipments of pig iron in February registered the highest volume for any commodity to the trade and amounted to 54,332 tons in comparison with 17,118 tons in February, 1937. Next ranking was steel ingots totalling 29,497 tons against 6,871 tons and black steel sheets followed with

a 19,986 ton total compared with 13,218 tons.

With a valuation of \$1,862,943, tin plate exports had the highest value of any semi-finished or finished iron and steel products exported during February despite its fourth ranking position on a volume basis. Following came black steel sheets valued at \$1,537,799; pig iron, \$1,076,064; ingots, \$989,665; casing, \$749,620; steel bars, \$725,486; strip steel, \$546,855; and galvanized sheets, \$434,354. With an aggregate value of \$9,688,388, the ten classes enumerated accounted for about 75% of the total value of all shipments recorded at \$12,643,356.

Pig Iron Increase Nearly 300 %

In the January-February, 1938, period, pig iron had the heaviest export volume, its total of 90,329 tons comparing with 30,447 tons shipped in the corresponding months of 1937. Ingots followed with 67,136 tons against 7,705 tons, the other leading products being plate, 39,349 tons against 18,831 tons; black steel sheets, 37,506 tons against 26,574 tons; tin plate, 34,136 tons against 44,264 tons; steel bars, 29,410 tons against 12,874 tons; shapes, 25,757 tons against 15,830 tons; and rails, 20,215 tons against 8,902 tons.

Among the industrial machinery shipped abroad during February, increases were recorded in all groups, particularly the power-driven metal-working in which foreign sales reached the record monthly value of \$9,459,830, a gain of 133% over the February, 1937, sales amounting to \$4,061,919.

Exports of wheel tractors among the farm equipment exports for February were valued at \$2,675,886 compared with \$1,387,620 during February a year ago. Sales were almost double last year in the 15-32 belt horsepower sizes, \$1,624,324 against \$840,730, and more than double in the 33 and over horsepower sizes, \$974,154 against \$417,137.

Chief among the leading exports which registered gains in February of this year as compared with February of 1937 were:

- vegetable food products and beverages, \$34,192 vs. \$16,319;
- unmanufactured tobacco, \$35,113 vs. \$24,050;
- non-metallic minerals, \$36,559 vs. \$31,353;
- petroleum and products, \$29,990 vs. \$25,029;
- refined mineral oils, \$19,758 vs. \$17,802;

automobiles including parts and accessories, \$28,088 vs. \$25,974.

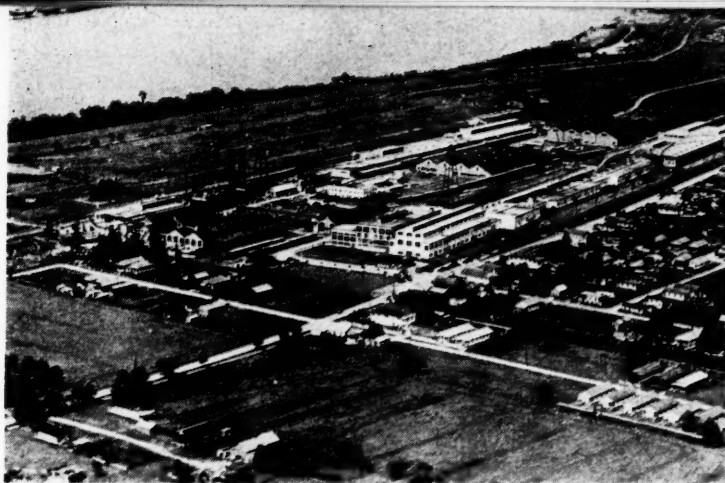
Paper Exports Higher

Exports of paper and paper base stocks during January reached a total value of \$3,168,696, an increase of \$575,698, or 22 per cent over the value for the corresponding month in 1937. The larger part of this gain was due to increased shipments of paper base stocks, which accounted for 31 per cent of the total exports in this group, as compared with 26 per cent in January 1937.

Exports of paper and paper products, amounting to \$2,185,450, surpassed the January 1937 exports in value by \$262,455, or 13½ per cent. Most items contributed to this increase and a comparison of the various items against last year's shipments indicates that the increase in volume was greater than indicated by the rise in value. In the printing group, exports of newsprint and cover papers were greater by more than 100 per cent; book papers dropped off 48 per cent, but surface-coated papers increased 30 per cent. Exports of wrapping papers were 19 per cent larger this year, the heaviest gains occurring in exports of kraft wrappings which doubled in volume. In the fine paper field, exports of tissue and crepe papers more than doubled and writing papers increased nearly 35 per cent. Boxboard shipments rose by 85 per cent and other paperboards by 148 per cent. Exports of paper boxes also doubled in volume.

Exports of paper base stocks, as noted above, continue to gain in importance. This is largely due to the increase in shipments of sulphite pulp, which accounts for nearly 70 per cent of the total. Exports of bleached sulphite, totalling 7,161 tons, were 11 per cent higher in volume this year, accounting for 63 per cent of the wood pulp shipments. A proportionately higher increase occurred in unbleached sulphite shipments which rose from 1,052 tons in January 1937 to 2,213 tons in January 1938. The balance of the wood pulp exports comprised 967 tons of soda pulp and 976 tons of other wood pulp. Rag exports totaled 1,169 tons and other waste for paper-making 2,550 tons as against 872 tons and 1,673 tons respectively during January 1937. The aggregate value of paper base stocks shipped abroad in January came to \$983,246, of which \$861,587 represented wood pulp exports. Exports during the corresponding month in 1937 were valued at \$670,003, of which \$521,413 represented wood pulp.

Industrial Use of Waste Sugar Cane



Celotex Mill, Marrero, La.

NOT only is the South rich in the wealth of raw materials which nature has provided, but as industries have multiplied in chemical manufacturing and other lines, and in the development of by-products, it is adding to employment and creating more wealth for the Southern states and for America. The extent to which such development may reach, filling human needs not only in the United States, the greatest of all markets, but throughout the world, no one can foretell. The standard of living is being raised to a degree never dreamed of by those of even a generation or two ago.

One example of the success of the utilization of a by-product is in the production of Celotex. Originated and developed in Louisiana as a by-product of sugar cane, it has in the short space of 16 years found markets all over the world. It is used not only in building work as structural insulation, but to keep out heat and cold, as well as termites, and is employed for such widely different purposes as in

children's games and automobiles, boats and incubators, radio chassis and refrigerators.

The Celotex Corporation, which manufactures this material, has representatives in 91 countries and salesmen in 136. In short, this product of the South occupies an increasingly significant place in both national and international business. Its base is bagasse, the cane fiber that remains after the sugar-bearing sap has been extracted. Although bagasse was of little economic value at the time to the sugar industry, mill operators were at first afraid the methods used for reclaiming it would interfere with the established operation of their plants. Many of them preferred to burn it in their furnaces, although it made an indifferent fuel. Eventually, however, a few were persuaded to change their furnace construction, burn a more suitable material and release the cane fiber to the new industry.

As a pioneer in a new field, it was neces-

sary to meet other problems besides this initial one. New types of machinery had to be constructed, ways and means devised for removing and storing the raw material, and for treating it to insure safe and proper preservation. In 1921 the largest board in the world came from the plant—800 feet long before being cut into commercial lengths. The demand was immediate and as a result two new plant units were added in 1923 and another the following year. In 1926 a second complete plant was built.

In the building up of industry, problems of many kinds are to be met and solved. While in 1920 there was enough sugar cane bagasse produced in Louisiana to manufacture a billion square feet of Celotex, the cane yield declined later and this necessitated on the part of the company a campaign to sell to planters new and more vigorous varieties of sugar cane. The result of this was that by 1929 some fields were yielding 40 tons per acre, or six times their former production. To make doubly sure that the essential supply of raw material would not again be threatened, it was necessary to organize associated companies to operate sugar plantations both in Louisiana and Florida.

An enterprise doing a business of such wide sweep must be the result of careful planning and foresight, and the overcoming of untoward conditions of various kinds, and yet it is upon such accomplishments that the progress of America has rested and must continue to rest.

Adventurers in a new field, with hope of profit it is true, but contributing as they go along directly to the benefit of the community in which they operate by adding to its wealth in utilizing a product that was waste, and in the manufacture of that product also contributing to the comfort and wellbeing of many thousands elsewhere. It has been found that this well-known material facilitates office and factory work because it helps in keeping the temperature at an even point, and thereby saves fuel and health. It subdues noises which are nerve-racking and thereby lends itself to better work.

Louisiana Sugar Cane from Which Celotex Is Made



Contracts Rise in March

INCREASES in Southern industrial and road construction during March carried the total for all types of work placed under contract last month almost twenty-one per cent ahead of the February total. March's total of all contracts, according to figures compiled from the items published in the daily issues of CONSTRUCTION, was \$55,079,000. This was about ninety-three per cent of the total for March of last year.

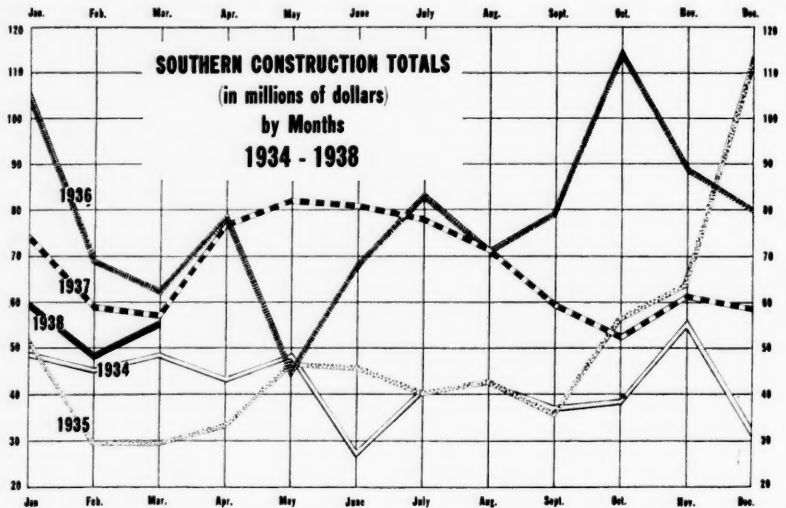
Contracts so far this year amount to \$162,686,000, a decline of thirty-nine per cent from the activity indicated by the totals for the first three months of 1937. A comparison of the figures for these two first quarter periods shows that of the four major classifications, three of them this year are ahead of last. The type of work lagging during 1938 is industrial and engineering.

Comparison of the totals for Marches of 1937 and 1938 reveals a similar situation. General building is slightly higher this year than last. The increase in public building is more than seventeen per cent. Road work is decidedly ahead of the pace set during March of 1937, the rise being more than thirty-nine per cent. Industrial and engineering contracts are now twenty-four per cent behind those made during the similar month of last year. This latter type of work last month, however, went sixty-eight per cent ahead of February and twenty-six per cent ahead of January.

Most of the \$19,984,000 total of indus-

trial and engineering contracts is for industrial projects, the value being \$16,759,000. This figure is larger than it has been since last August. Its increase over January's \$9,204,000 is forty-five per cent. It is two hundred fifty per cent in ad-

in this field during the month. Alabama, Arkansas, Georgia, Kentucky, Louisiana, Maryland, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, Texas, Virginia and West Virginia, as well as the District of Columbia, all



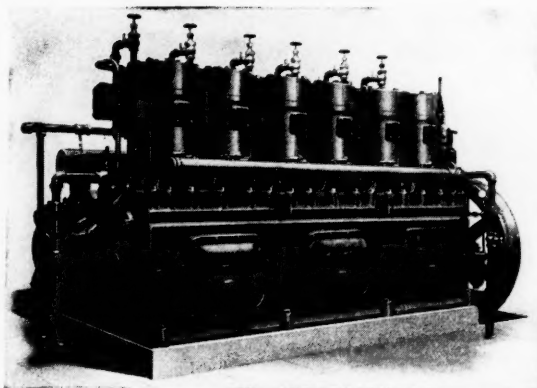
vance of such contracts awarded during February.

Road construction during March gained more than seventeen per cent over February. The total was \$11,666,000. Fifteen of the Southern states were active

opened bids or made awards for road and bridge construction. Indications pointed to an improvement in county road and city street work as preparations were made to issue bonds and contract for projects estimated to amount to sizeable

Southern Construction Activity

	Contracts Awarded March 1938	Contracts Awarded March 1937	Contracts to be Awarded March 1938	Contracts to be Awarded March 1937	Contracts Awarded First Three Months 1938
GENERAL BUILDING					
Apartment and Hotels	\$2,086,000	\$2,482,000	\$3,069,000	\$3,902,000	\$10,235,000
Association and Fraternal	238,000	60,000	475,000	935,000	693,000
Bank and Office	1,934,000	804,000	375,000	4,595,000	4,084,000
Churches	741,000	196,000	1,275,000	1,011,000	1,567,000
Dwellings	5,384,000	8,578,000	22,326,000	5,965,000	15,094,000
Stores	4,352,000	2,549,000	2,871,000	4,520,000	11,158,000
	\$14,735,000	\$14,669,000	\$30,391,000	\$20,928,000	\$42,831,000
PUBLIC BUILDING					
City, County, Government and State	\$5,225,000	\$4,653,000	\$15,935,000	\$29,368,000	\$19,541,000
Schools	3,469,000	2,734,000	13,308,000	13,563,000	15,484,000
	\$8,694,000	\$7,387,000	\$29,243,000	\$42,931,000	\$35,025,000
ROADS, STREETS and BRIDGES	\$11,666,000	\$8,392,000	\$47,068,000	\$54,710,000	\$38,379,000
INDUSTRIAL and ENGINEERING					
Drainage	\$935,000	\$7,485,000	\$9,763,000	\$4,525,000	\$6,945,000
Filling Stations and Garages	325,000	530,000	190,000	813,000	1,281,000
Industrial Plants	16,759,000	17,245,000	31,041,000	68,264,000	30,746,000
Sewers and Waterworks	1,965,000	1,155,000	9,665,000	8,200,000	7,479,000
	\$19,984,000	\$26,415,000	\$50,659,000	\$81,802,000	\$46,451,000
Total	\$55,079,000	\$56,863,000	\$157,361,000	\$200,371,000	\$162,686,000

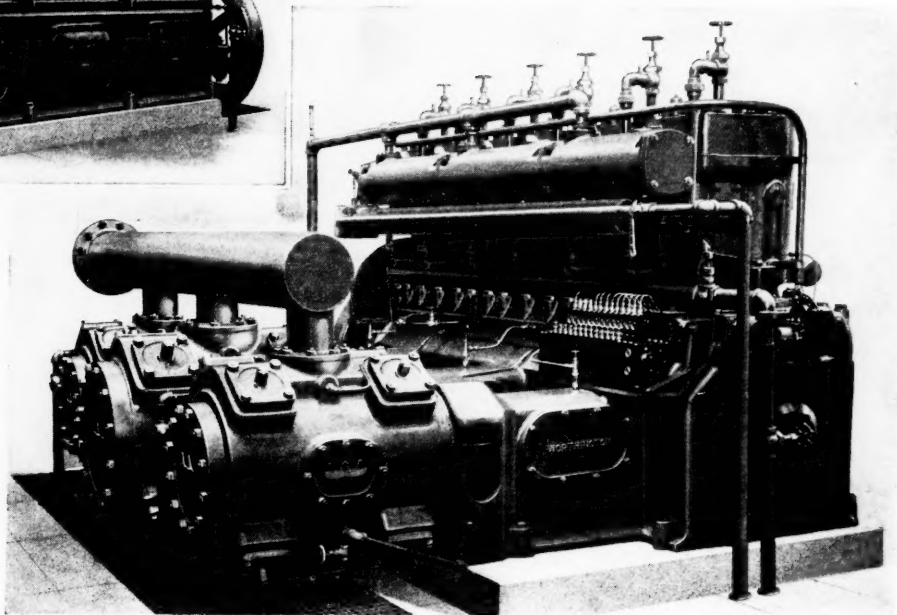


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225-hp., 300-hp.**



THESE compact self-contained units are shipped with major elements assembled, therefore cost less for initial installation and are on the job quickly.

Readily relocated as complete units to meet changing conditions... no dismantling or disturbing original adjustments... hence prompt return to service... a direct production value.

- Maximum accessibility of vital engine parts because of straight-line construction.
- Twin ignition*... an exclusive Worthington feature.
- Force-feed lubrication... pioneered by Worthington.
- Compressor cylinders quickly changed for changed conditions.
- Totally enclosed... dirt and dust proof.

* At small additional cost

A WIDE RANGE OF FUEL ADAPTABILITY

Worthington Type LCE Compressors operate on a wide variety of fuels... refinery, field and manufactured gases... thereby protecting continuous operation.

WORTHINGTON PUMP AND MACHINERY CORPORATION

General Offices: **HARRISON, NEW JERSEY** - Branch Offices and Representatives in Principal Cities throughout the World

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WASHINGTON

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APRIL NINETEEN THIRTY-EIGHT

37

Contracts Rise In March

(Continued from page 36)

sums. Numerous W. P. A. enterprises were approved.

The uncertainty brought about by the Administration's request that the states forego part of their legal Federal Aid allotments was dispelled as the Secretary of Agriculture sent out letters to all the states practically reversing the former policy and requesting that the road programs be submitted to the Bureau of Federal Roads as soon as possible to facilitate initiating the work.

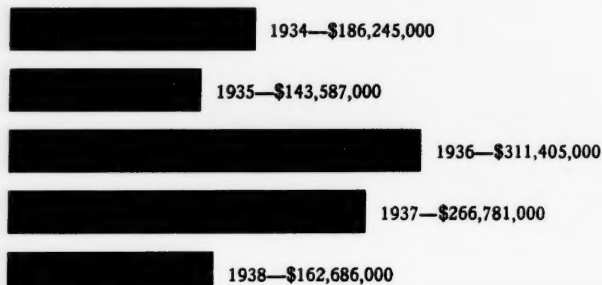
Private building during March remained relatively stable. A decrease of six per cent was apparently caused by slackening apartment and hotel expansion. A drop of fifty-five per cent in this type of work, as well as a decrease in association and fraternal construction, was offset almost entirely by increases in other kinds of private building projects. Bank and office contracts rose almost sixty-eight per cent. The gain in church

construction was ninety-six per cent. Residential erection registered a nineteen per cent rise, with store improvements a little ahead of the preceding month.

Public building slid further along a

downward course, which started in January after a peak total for the month before. The decrease of March from the February figure of \$11,333,000 was twenty-three per cent.

First Quarter Comparisons All Construction, 1934-1938



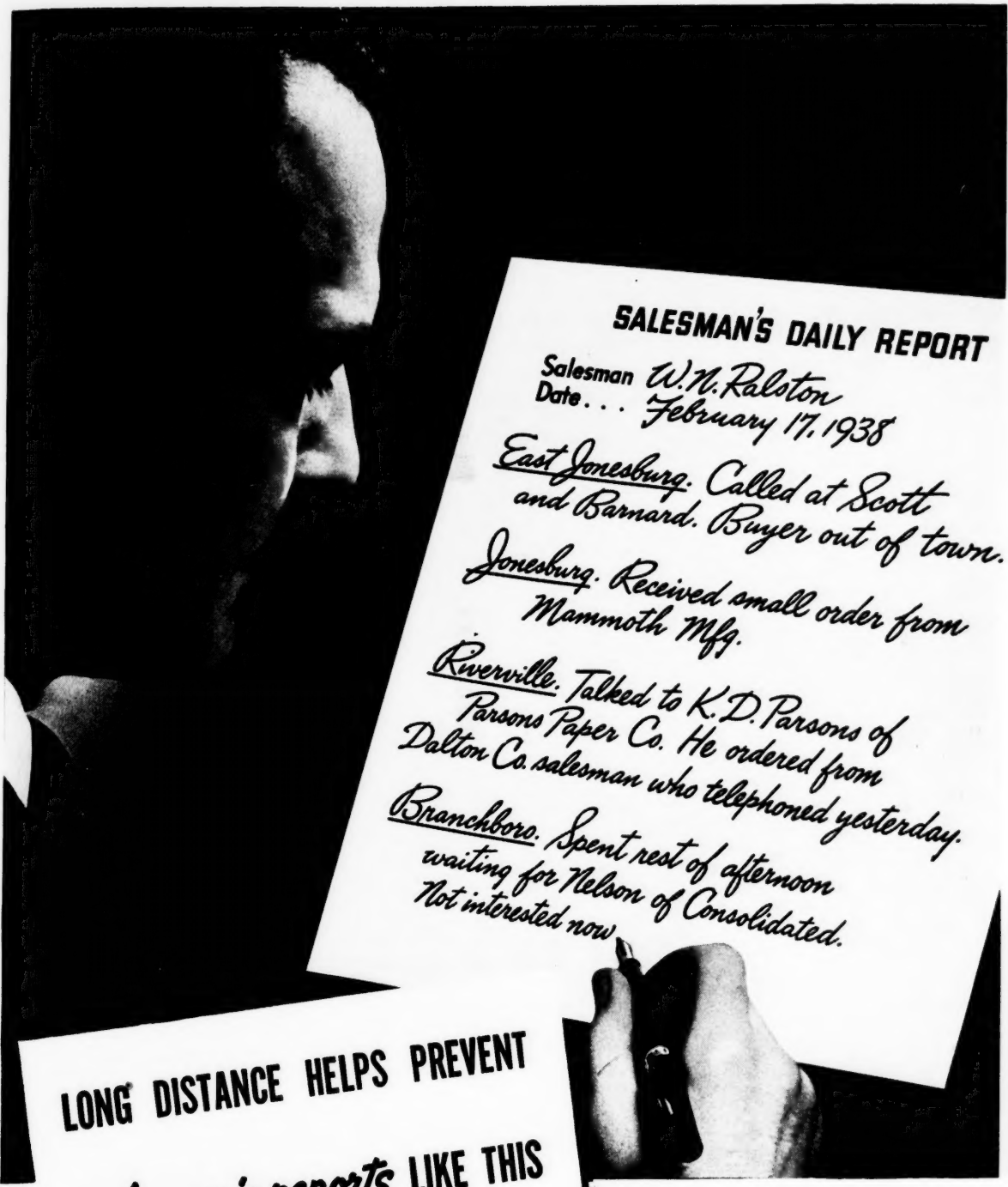
Representative Projects in South Last Month

Proposed Construction

D. C., Washington—District Commissioners High School (Calvin Coolidge); Nathan C. Wyeth, Municipal Archt.	1,350,000
Fla., Jacksonville—Bull Steamship Line Dock and warehouse	500,000
Ga., Athens—City Slum clearance project; J. W. Barnett & Co., Atlanta, Ga., Engr. and Archt.	500,000
Ga., Rome—Montgomery Ward & Co. Store; Robert H. Rowey, Archt.	125,000
La., Lake Charles—Calcasieu Parish Buildings; Weiss, Dreyfous & Seiferth, New Orleans, Archts.	850,000
Md., Baltimore—Dwellings; Bernard F. Owens, Archt.	500,000
Miss., Natchez—City Tire plant; James T. Canizora, Archt., Jackson, Roberts & Schaefer, Engrs., Chicago	300,000
Miss., Vicksburg—Marquette Cement Co. Terminal	250,000
Missouri—War Department Wappapello dam	5,000,000
N. C., Gastonia—National Weaving Co. Hosiery mill	150,000
N. C., Raleigh—North Carolina State College Chemistry building; George Watts Carr, Durham, Archt.	400,000
Oklahoma—Oklahoma Gas & Electric Co. Generating stations, transmission system, sub-stations, distribution system, sub-stations and sub-station improvements	3,043,000
Okla., Ponca City—G. Boole Hotel; G. L. Gannon, Engr.	250,000
S. C., Greenville—Emory C. Green, and Ray H. Taylor Apartment	400,000
Tenn., Memphis—D. T. Kimbrough, Jr. Dwellings	1,500,000
Tenn., Memphis—Willard Battery Co. Plant	100,000
Tex., Alice—W. L. Moody, Jr. Hotel	100,000
Tex., Crockett—Houston County Courthouse; Blum E. Hester, Houston, Archt.	200,000
Tex., Dallas—Southwestern Bell Telephone & Telegraph Co. Program	2,250,000
Tex., Galveston—Galveston Wharf Co. Shed	250,000
W. Va., Charleston—Kanawha County Board of Education Ten schools; Montgomery and Patterson, Herbert S. Kyle, Walter Martens, L. T. Benston, Inc., Archts.	200,000
W. Va., Huntington—International Nickel Co. Improvements	300,000
W. Va., Morgantown—Chesapeake & Potomac Telephone Co., of West Virginia Building	450,000

Contracts Awarded

D. C., Washington—Jewish Community Center Building addition; Charles H. Thompson Co., Contr.	100,000
Fla., Jacksonville—Walgreen's Drug Store Building; J. M. Raymond Construction Co., Contr.	125,000
Fla., Miami—Burdine's Inc. Store; Rodney Miller, Inc., Coral Gables, Contr.	500,000
Fla., Miami—Fleischer Studios Motion picture theatre; Delaware Housing Corporation, Contrs.	300,000
Ga., Atlanta—Massell Realty Co. Store units; owner builds	250,000
Ga., Rome—U. S. Engineer Office, Mobile, Ala. Flood control project; J. E. Milam Construction Co., Atlanta, Contr.	254,000
Ky., Middlesboro—U. S. Engineer Office, Nashville Flood control project; L. O. Brayton & Co., Dyersburg, Tenn., Contr.	254,000
La., New Orleans—Charity Hospital of Louisiana Nurses' home; Burkes Brothers, Contrs.	683,000
La., Winnsboro—Franklin Parish School Board Building additions; C. H. Treadwell, Shreveport, Contr.	131,000
Md., Baltimore—National Can Co. Warehouse; Brown & Matthews Co., New York, Contr.	125,000
Md., Baltimore—Northwood Apartments, Inc. Apartment houses; Ring Construction Co., Alexandria, Va., Contr.	1,000,000
Md., Baltimore—Prudential Co-Operative Realty Co. Apartment; owner builds	125,000
Md., Baltimore—Frank Novak Realty Co. Residences; owner builds	129,000
Mo., Jefferson City—State Building Commission Out-going prison; E. C. Childers Construction Co., Contr.	552,000
Mo., Richmond Heights—Manhasset Village Corp. Apartment development; H. B. Deal & Co., Inc., Contr.	2,000,000
Okla., Bartlesville—Masonic Lodge Air conditioning; W. R. Grimshaw Co., Tulsa, Contr.	100,000
Okla., Enid—H. H. Champlin Dwelling; W. C. Bass & Son, Contr.	150,000
S. C., Charleston—City Board of School Commissioners Junior High School; J. A. Jones Construction, Charlotte, N. C., Contr.	308,000
S. C., Greenwood—Finance Board of Greenwood County Dam, spillway and power house (Buzzard Roost); E. W. Grannis, Fayetteville, N. C., and Lee Construction Co., Charlotte, N. C., (low bidder)	869,000
S. C., Rock Hill—Winthrop College Auditorium and music building; Hardaway Contracting Co., Columbus, Ga., Contr.	598,000
Tex., Dallas—Coca Cola Co. Syrup plant, Inge Construction Co., Contr.	1,000,000
Tex., Fort Worth—City and Tarrant County City-County Hospital; Gurley Construction Co., Contr.	206,000
Tex., Houston—Mrs. Mellie Esperson Air condition building; York Ice Machinery Co., York, Pa., Contr.	350,000
Va., Roanoke—Veterans Administration Buildings; A. Farnell Blair, Lake Charles, La., Contr.	494,000
W. Va., Wheeling—Court Theatre, Don Byrum, Contr. Remodel building	175,000



SALESMAN'S DAILY REPORT

Salesman *W. H. Ralston*
Date . . . *February 17, 1938*

East Jonesburg. Called at Scott and Barnard. Buyer out of town.

Jonesburg. Received small order from Mammoth Mfg.

Riverville. Talked to K. D. Parsons of Parsons Paper Co. He ordered from Dalton Co. salesman who telephoned yesterday.

Branchboro. Spent rest of afternoon waiting for Nelson of Consolidated. Not interested now.

LONG DISTANCE HELPS PREVENT
salesmen's reports LIKE THIS

them more productive. ★ Telephone appointments arranged in advance help to eliminate wasted visits and long lobby-waits. Telephone contacts between trips prevent loss of business, clear up complaints, keep customers friendly. ★ Long Distance is fast, personal—pays dividends on modest monthly investments. Try it and see.

Long Distance telephone service cuts the time required to see prospects—makes time spent with



Iron, Steel and Metal Market



STEEL operations continued to rise in the last week of March, reaching 35.7 per cent of ingot capacity. This is the best figure since the middle of November and is nearly 22 per cent increase in the production rate of the last four months. In the same week a year ago, operations were more than 90 per cent of capacity. The demand for miscellaneous products showed evidence of improvement on the part of buyers who have not recently been active. Inventory reductions probably are accountable.

Increased operations were general in the various steel making districts. It is fair to assume that while the rate increase granted by the Interstate Commerce Commission to the railroads is not as great as was asked for and expected, it will help the roads to finance part of their requirements at least for new equipment. Youngstown reports slowly expanding business with steel men more inclined to believe that April and May will continue to show increased production figures.

In the Birmingham market the demand for finished steel and the operations of the Tennessee Coal, Iron and Railroad new tin plate mill accounted for that district maintaining its steel output at 66 per cent of capacity. Birmingham's production has been above 60 per cent for a considerable period. The new plant of the Tennessee Coal, Iron & Railroad covers 22 acres with 3,000 employees. Its capacity will be 200,000 tons per year. Orders from the Orient have also been accountable for Birmingham keeping above the country's level both in steel and pig iron manufacture. In the erection of the tin plate mill, there was required probably 25,000 tons of structural steel. Iron makers have been operating also at rates considerably above the average.

Wire mills are reported to have had sales in March running 20 per cent ahead of February. Summing it up, it may be said that the barometer of business, which steel has always been, shows a slightly more encouraging prospect than has been the case for several weeks.

Several of the steel companies have entered into the small home building field in a very active way. Those in a position to know hold the opinion that prefabrication

in home building is likely to become an industry of very marked importance. This is not confined solely to steel but is a field in which steel will play an important part.

Naturally the fear that has possessed buyers everywhere has affected the steel markets as it has other markets. This is especially noticeable as spring advances and demand, or lack of it, for automobiles has dropped. Manufacturers have been compelled to change their production plans to meet changed conditions. These forward looking industrial leaders, however, have vigorously attacked the used car problem so as to clear the way for a larger output of new cars. They realize the necessity for overcoming the buying ennui that has existed and have set out to convince the automobile using public that it is wrong to drive machines over five years old. Dealers report very encouraging success from the campaign so far, as prices on used cars have been marked down in many instances to more nearly meet buyers purchasing ability.

The Senate investigation of steel scrap exports is down for reopening April 5th. Senator Thomas of Utah is quoted as being doubtful of an embargo bill being passed. He is said to believe there is sufficient reserve of scrap to remove any economic justification for the bill and, furthermore, that it has no bearing on the cause of war. In his judgment, building up supplies for preparedness in nickel, tin, manganese, etc., is more important.

Activity in export copper sales increased noticeably when the price went from \$9.75 to \$9.80 c. i. f. European base ports. Domestic copper was around ten cents a pound. Lead remained at \$4.50 a pound, New York, and zinc at \$4.25 at East St. Louis.

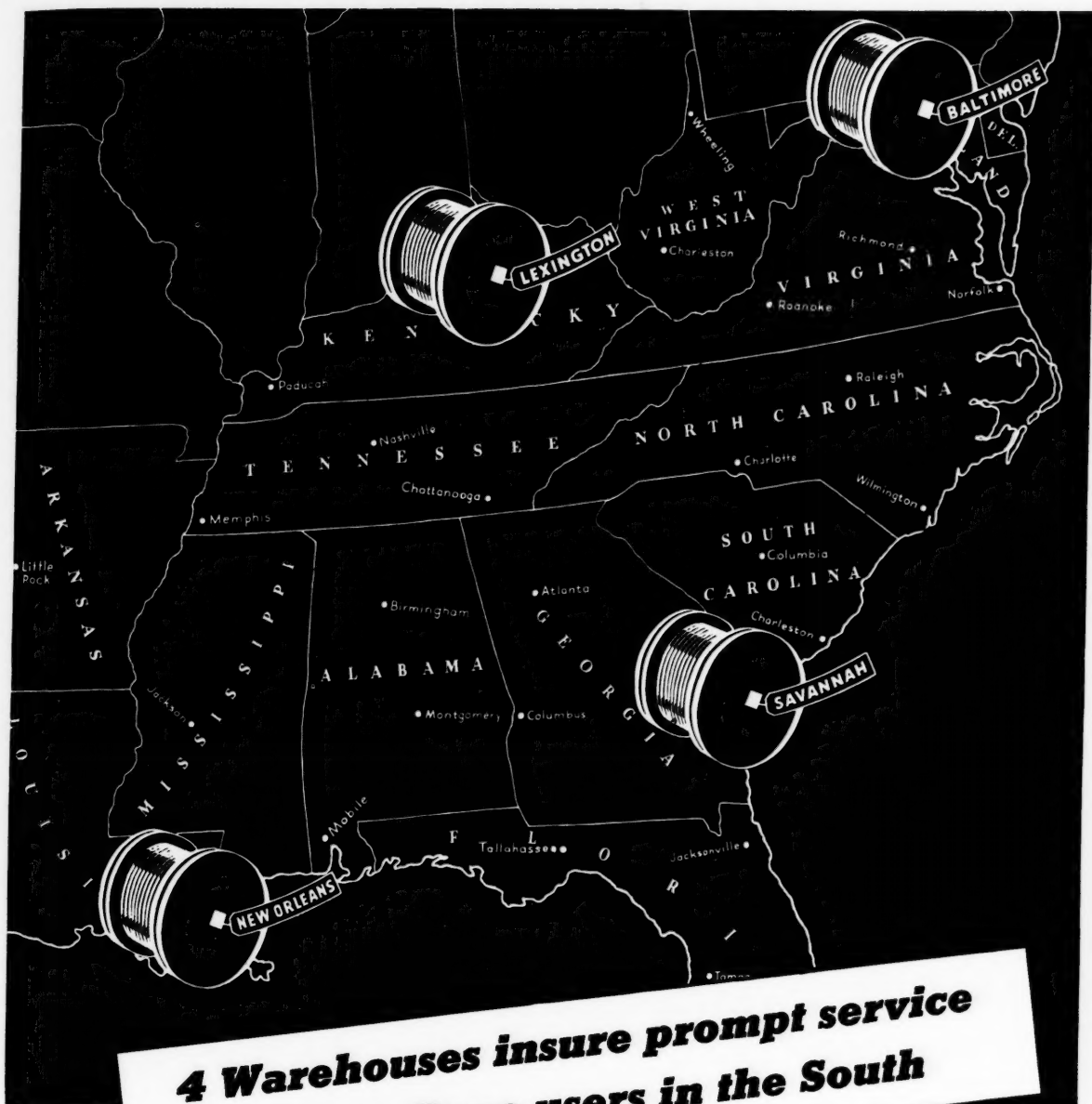
Orders for fabricated structural steel during January and February was about half the rate of the same period a year ago. In February these were 49,780 or 21.3 per cent of the period regarded as normal from 1928 to 1931 inclusive.

New records in several respects were established by the American Rolling Mill Company and its subsidiaries during 1937, notwithstanding considerable reductions at the last of the year. The number of

employees increased from 16,536 at the end of 1936 to an all time peak of 18,475 in July, 1937. This number, however, declined to 16,204 at the end of the year. Wages were 47 per cent above the wage rates in 1929.

The Association of Iron and Steel Engineers will hold its Annual Spring Conference in Baltimore, Maryland, April 28 and 29. Mr. L. F. Coffin, superintendent of the mechanical department, Bethlehem Steel Company, Sparrows Point, Maryland, will be General Chairman of the Program. Mr. Coffin is also the president of the Association of Iron and Steel Engineers. Mr. F. O. Schure, electrical superintendent of the Bethlehem Steel Company, Sparrows Point, Maryland, will be General Chairman of the Arrangements Committee. Over a thousand steel mill executives and operating engineers are expected to take part in the proceedings. There will be two technical sessions, the first of which will be held the evening of April 28th. Mr. C. J. Doby, chief engineer, Republic Steel Corporation, will be chairman of this session. Mr. W. A. Perry, superintendent electrical and power departments, Inland Steel Company will preside as chairman of the second session on April 29th. A feature of the conference will be an inspection trip to the Bethlehem Steel Company's Maryland Plant at Sparrows Point, where the visitors will be shown the 56-inch Hot and Cold Strip Mills and the new Rod and Wire Mills.

As this number of the MANUFACTURERS RECORD goes to press, the opinion is general that with increasing demand the production of mills will increase during this second quarter with operations showing a profit in contrast to what is the probable result of the first quarter's work. Forty-five per cent of capacity should bring a profit, although it is recognized that predictions are difficult in such a time of confusion as at present. One thing is certain, a great deal of new construction will be needed when business picks up. It may be that one man's guess is as good as another's and while realizing that steel demands, as in other lines, depend upon business conditions, the consensus of belief is that the last half of the year should be better than the period through which we are now passing.



WITH the placing of wire rope stocks at Savannah, Ga., and Lexington, Ky., Bethlehem now has four warehouses serving the South—the other two being at Baltimore and New Orleans.

Ample stocks are maintained at these strategic points to meet any ordinary requirements. Particular emphasis is placed on the types of rope that meet special needs of principal industries in the areas served by the respective warehouses.

District offices in principal cities throughout the South provide for close attention to your requirements. A letter or telephone call to the nearest office will quickly bring an experienced wire rope man to study any special rope problem that you may encounter.

If you are not already a user of Bethlehem Wire Rope, we suggest that you try this source of supply and see what service the Bethlehem organization can render.

BETHLEHEM STEEL COMPANY



Lumber



News of the Month

Southern Pine Trends

Production at mills reporting for the Southern Pine Association *Weekly Trade Barometer* is currently at 92% of its average for the previous three years; shipments are at 92% of "3-year average" production; and orders are at 85% of "3-year average" production. For the first eleven weeks of 1938, production has averaged 87% of "3-year average," shipments 90%, and orders 91%. Production is tending slightly upward compared to the early weeks of 1938; shipments recently have been about equal to production; while orders are trailing their January performance and are currently lagging behind both production and shipments. Active mills are operating about 45 hours a week, while average operating time for all reporting mills, including non-producing units, is about 35 hours a week.

Weekly trends of Southern Pine production, shipments and orders, 1938 compared to corresponding weeks of 1937 and 1929, are as follows:

SOUTHERN PINE PRODUCTION, SHIPMENTS AND ORDERS
Average Per Unit

Week Ended	Production (M. Ft.)			Shipments (M. Ft.)			Orders (M. Ft.)		
	1938	1937	1929	1938	1937	1929	1938	1937	1929
Jan. 8	251	300	371	223	309	351	246	310	394
15	258	285	380	262	325	365	321	323	422
22	264	288	366	314	319	396	354	381	405
29	268	294	380	306	394	419	317	376	391
Feb. 5	252	309	378	275	349	391	267	355	461
12	275	315	374	273	360	377	277	326	420
19	266	336	364	261	386	359	266	303	377
26	272	322	372	289	368	383	272	288	384
Mar. 5	285	312	374	290	298	376	245	269	440
12	279	327	369	271	322	368	268	308	405
19	282	316	351	282	302	398	262	279	447
Avg. 11 Wks.	268	309	371	277	339	380	281	320	413
% of 1929	72	83	100	73	89	100	68	78	100

Source: Southern Pine Association *Weekly Trade Barometer*, data from average of 125 mills.

This table shows that production for the year through March 19, has decreased 13% from 1937, and is 28% below 1929. Shipments are 18% below 1937, and 27% below 1929. Orders are off 12% from 1937, and are 32% below the heavy bookings in the like period of 1929.

Stocks at mills reporting for the *Barometer* are now about one-third larger than a year ago and 5% above normal. Unfilled orders are about one-third less than a year ago. The current volume of output, although tending slightly upward, is 43% below normal. Stocks, therefore, are not excessive, and any sharp upward

trend in demand will probably find stocks reduced more rapidly than production is increased. Prices, f.o.b. mill, are down 25% or more from a year ago and are barely returning the cost of production. Further declines are improbable, and market analysts are predicting a gradual increase to more competitive levels.

Aside from the poor comparison with early 1937, operations thus far in 1938 compare favorably with the same period of 1936 and are much better than for prior years back to 1930. When housing developments aided by federal legislation are under way, and the building season opens in districts North of the Ohio River, it is expected that lumber demand, if not influenced by other than economic

conditions, will increase sharply, and that performance during the latter half of this year may cause the year as a whole to top 1937.

U. S. Lumber and Log Exports and Imports

Total exports of hardwood and softwood lumber (including boards, planks, scantlings, flooring, sawed timber) and logs for the month of January 1938 totalled 90,962 M board feet as compared with 77,423 M feet for January 1937, according to the U. S. Bureau of Foreign and Domestic Commerce.

Of total January 1938 exports, 81,433 M feet was of sawed material as compared with 70,485 M feet for January 1937, a gain of 16 per cent. January 1938 exports of logs and hewn timber amounted to 9,529 M feet as against 6,938 M feet for January 1937, a gain of 37 per cent.

In the sawn softwood group, Douglas fir totalled 24,506 M feet as compared to 1,775 M feet of January 1937. Southern pine exports totalled 25,636 M feet compared with 30,428 M feet respectively. January shipments of sawn hemlock totalled 21 M feet, whereas in January 1937, there were no exports whatsoever. Other woods in this group exported were:—(January 1938 compared with January 1937, respectively) redwood, 388 M feet vs. 241 M feet; cedar, 581 M feet vs. 274 M feet; cypress, 510 M feet vs. 252 M feet; spruce, 686 M feet vs. 1101 M feet; and white, Ponderosa and sugar pine, 2039 M feet vs. 2124 M feet.

Sawn hardwoods including flooring totalled 26,832 M feet for January 1938 as compared to 34,236 M feet for January 1937. In this group, ash, gum (tupelo and black) and hickory were the only species exported in larger volume than in January 1937.

Softwood log exports for January 1938 totalled 5,637 M feet as compared to 5,797 M feet for January 1937. Hardwood log exports for January 1938 totalled 3,892 M feet as against 1,141 M feet for January 1937. Of the January 1938 exports, Douglas fir accounted for 4,909 M feet; ash and hickory, 1,257 M feet, and cottonwood and aspen, 1,331 M feet. Log exports of other species were very small.

Total imports of hardwood and softwood logs and lumber (including clapboards and cabinet woods) for January 1938 totalled 46,593 M feet as compared with 54,798 M feet for January 1937. Of this 1938 amount, 11,981 M feet were logs (hardwoods and softwoods), 29,328 M feet was softwood lumber (including clapboards) and 5,284 M feet were hardwood lumber and sawed cabinet woods, as against 9,746 M feet of logs, 37,214 M feet of softwood lumber and 7,838 M feet of hardwood lumbars and sawed cabinet woods for January 1937.

FOR TODAY'S FACTORIES...

THERE IS NO MORE *Practical Flooring*

THAN NORTHERN HARD MAPLE

Scores of years have passed since the first Hard Maple factory floor was laid — years in which countless plants have proved this flooring does not disappoint. And today, more than ever, Hard Maple is the logical choice.

For here is a flooring that is "right" for workman and right for employer. To management, it brings a remarkable record for durability, remarkably low costs per year of service — for installation, for cleaning, for maintenance. Again, its smoothness speeds up traffic; it simplifies alterations, machinery shifting and renewal; it creates no dust to injure the delicate bearing surfaces of modern machinery.

But here also, is a flooring in step with 1938's regard for workers' liking for their jobs. Hard Maple is warm, dry and resilient — clean and

highly sanitary — light-reflecting and sound-absorbing. It slows up fatigue, protects health, pleases the eye — in every way contributes to workers' comfort, workers' efficiency, workers' good will.

Nature has endowed Hard Maple with a special response to *all* the modern conditions of doing business. Here is a flooring which checks on *every* count, which matches satisfaction in *use* with satisfaction in ultimate *cost*. Before you build or remodel, consider *all* the factors and see how modern is Maple's answer. Your architect can give you full information about floors of **MFMA*** Northern Hard Maple, in strips or blocks.

See our catalog data in Sweet's, Sec. 11/76. Write for folder describing heavy-duty finishes for old or new floors, which seal Maple's surface and further reduce cleaning costs.



Northern Hard Maple floor in Chicago Towel Company's Flat Work Department

**To be sure of Association guaranteed grading, specify and look for the MFMA trademark (indented and stamped). The following manufacturers are licensed to use it:*

Beck, August C. Co., Milwaukee, Wis.
Brown Dimension Co., Manistique, Mich.
Bruce, E. L. Company, Memphis, Tenn.
Mill at Reed City, Mich.
Connor Lumber & Land Co., Laona, Wis.
Sales Office, Marshfield, Wis.
Farrin Lumber Co., M. B., Cincinnati, O.
Holt Hardwood Co., Oconto, Wis.
Kerry & Hanson Flooring Co., Grayling, Mich.
Kneeland-Bigelow Co., Bay City, Mich.
Kneeland-McLurg Flooring Co., Phillips, Wis.
North Branch Flooring Co., Chicago, Ill.
Oval Wood Dish Corp., Tupper Lake, N. Y.
Robbins Flooring Co., Rhinelander, Wis.
Stephenson Company, I., Wells, Mich.
Wells, J. W. Lumber Co., Menominee, Mich.
Wisconsin Land & Lbr. Co., Hermansville, Mich.
Yawkey-Bissell Lumber Co., White Lake, Wis.

Floor with MFMA Maple



**MAPLE FLOORING MANUFACTURERS
ASSOCIATION**

1797 McCormick Building, Chicago, Illinois

APRIL NINETEEN THIRTY-EIGHT

43

Good Roads and Motor Transport

Southern Road Construction Program

Southern road construction during the past three months has been eleven per cent ahead of what it was for the comparable period of last year, it is revealed by the latest tabulation of reports published in the daily issues of CONSTRUCTION. The total for contracts so far this year is \$38,379,000. Road work placed under contract during the first quarter of last year amounted to \$32,755,000.

All of the sixteen states below the Mason and Dixon line have been pushing their road construction during the current year. Last month the whole group made some move toward carrying out their 1938 programs. Bids were received or asked and contracts were let or work orders were issued to proceed on projects for which the awards had previously been made.

This improvement in the road building situation is expected to be further stimulated by removal of the uncertainty created last autumn when the Administration recommended cancellation of the 1939 Federal Aid funds, both the regular annual apportionment and the sums available for grade crossing elimination. These automatically became available at the first of the year, when Secretary of Agriculture Henry A. Wallace made the allocations as required by law.

Last month the obstacle of possible cancellation of these allotments, which are virtually a contractual agreement with the various states, was cleared from the paths of the road builders. The Secretary of Agriculture on March 18 sent out letters to the Governors practically reversing the President's suggestion that they defer accepting the 1939 authorizations. "The President now feels," he wrote, "that you should not be asked to further delay the submission of the road-building projects of your State, and accordingly I suggest that such projects be now submitted in the order of their priority."

This action was understood to be the result of the many protests that deluged Washington as soon as President Roosevelt issued his message on curtailment of Federal road construction funds. Popularity of the Federal Aid appropriations had been underestimated. Congressional opposition was so pronounced that there was evidence at the middle of December that the reduction proposal would be abandoned.

Many of the states took action immedi-

ately upon announcement of the change of policy. Some states had planned their road programs with the expectations that the Federal funds would be forthcoming and were prepared to take advantage of the opportunity to submit their projects to the Bureau of Public Roads.

Maryland is in a position to definitely program additional projects which had been held up pending the decision and proposed to proceed with advertisement of bids for projects held in abeyance. The effect in Virginia was that about two million dollars worth of work will be immediately forwarded to Washington for approval, with two million more in thirty days and the balance shortly thereafter, making a total of about six million dollars. Florida issued its final budget for 1938. The 1939 Federal Aid program of West Virginia has not yet been submitted.

In both North Carolina and Tennessee the authorities had been going ahead in the usual way, as fiscal years in those states begin July 1. Regular Federal Aid in the latter state will amount to approximately five million dollars for the year, with another million available for elimination of grade crossings and about a second additional million for secondary roads. The Federal appropriation, together with the funds matched by North Carolina, make up almost the whole new highway construction for that state. There had been no delay in plans due to the general expectation that the Federal appropriation would not be cancelled.

Georgia had previously issued the figures for its program. The \$17,000,000 total was based on the assumption that the 1939 Federal funds would be released, although the projects had not been submitted to the Federal authorities last November and consequently are not now ready. Georgia funds held up included \$3,184,850 regular Federal Aid; \$1,194,288 Federal funds for railroad grade crossing separation and protection and \$630,970 for Federal rural post road work.

Alabama has already submitted a partial secondary program for approval. A complete grade crossing elimination program will be submitted this week and the regular Federal Aid program will follow. This means that Alabama is assured of a ten million dollar Federal Aid highway program this year and a seven and one-half million dollar program for next year.

The State of Mississippi was not relying heavily upon the Federal funds for its road construction. The legislature of that state is now in session and has provided

an additional \$40,000,000 for highway work, which will enable matching of all Federal funds. With the 1938 and 1939 regular Federal Aid funds, the Mississippi program will total approximately \$45,000,000.

Meanwhile the bill to continue Federal Aid in the same proportions as provided for in the present authorization is now being considered by congressional committee.

The Highway to Key West

The Overseas Highway, connecting link between the Florida mainland and Key West, was opened to traffic at the end of March.

Extending for 170 miles from Miami and at a cost of almost seven and a half million dollars, this triumph of engineering skill has a vicarious history. To Key West, victim of continuous financial reverses during the past decade, the new highway brings hopes of a return to prosperity.

Originally started in 1923 with a bond issue of \$300,000 (\$149,000 for roads and \$151,000 for seven wooden bridges) by Monroe county and another one of \$125,000 by Dade county, work started immediately at both ends of the proposed road. By September 1924 it was possible to drive six miles out over the ocean from Key West.

In 1925 another bond issue was approved for \$2,650,000 but the cost exceeded the engineers estimates for this particular part of the highway construction and an additional \$650,000 was voted in 1927. In January, 1928 the highway was opened to the public with ferries servicing the 40 mile strip of water between Lower Matecumbe and No Name Key—a stretch which was reduced two years later to nearly 25 miles. From that time until the hurricane of 1935, little or no progress was made though not through lack of attempts.

Following the 1935 hurricane when permission was granted by the Interstate Commerce Commission to abandon the railroad line and right of way, the remaining 26½ miles was offered for sale and bought by the Overseas Road Commission, arrangements being made for highway construction through a grant of the P.W.A. Contracts were let to Thomson & Company and Wannamaker & Wells with construction beginning in January, 1937.

The finished road is 20 feet wide and built upon the old railroad bed.

JUST HOW MUCH DOES CONCRETE SAVE ON SURFACE MAINTENANCE?



THIS unretouched recent photo shows Illinois State Route 125 entering Springfield. It was paved in 1914. Maintenance figures from 1925 to 1936, inclusive, reveal that this pavement, which carried 1650 vehicles per day in 1936, has cost only \$67 per mile per year to maintain.

Another example is a 25-year-old strip near LaSalle, one of the first concrete roads in Illinois. Though carrying heavy traffic (4000 vehicles per day in 1936), the original surface is still smooth riding and structurally sound. State highway department records show that surface maintenance averaged only \$122 per mile per year from 1927 to 1936.

Surface maintenance for *all* concrete on the Illinois state system from 1921 when records

began, up to 1936, averaged only \$80.64 per mile per year.

* * *

A summary of all available state highway records shows that 49,000 miles of concrete in 21 states have averaged only \$103 per mile per year for surface maintenance.

This is conclusive evidence of the consistent economy of concrete—all the more so because, in general, concrete roads carry the heaviest traffic.

Concrete pavements save taxpayers millions of dollars in maintenance. Add this to the savings represented by concrete's low first cost for equal load-carrying capacity, long life, and economy of vehicle operation, and you can see that concrete is an economical pavement under a wide range of conditions.



PORTLAND CEMENT ASSOCIATION

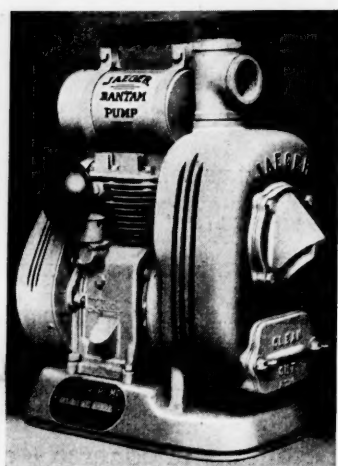
Dept. A4-21, 33 W. Grand Ave., Chicago, Ill.

*A National Organization to Improve and
Extend the Uses of Concrete*

New Ways of Doing Things

Light Automatic Priming Pump

Built of aluminum alloy and weighing only 52 pounds, a new automatic priming pump is announced by The Jaeger Machine Company of Columbus, Ohio. Its rated capacity of 5200 gallons per hour is said to be the largest ever developed by a pump of this light weight. The priming section, employing the Jaeger patented Priming Jet, insures self-priming at lifts up to 25 feet. Standard with the unit is



Light Pump of Large Capacity

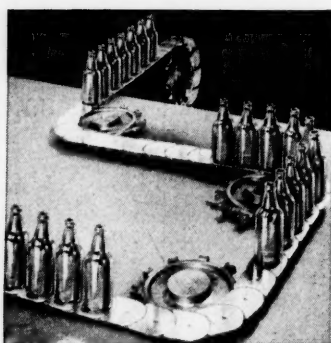
a $\frac{3}{4}$ to 1 horsepower ball bearing engine with carburetor and an unusually large gasoline tank of 0.4 gallon capacity. It is also furnished with a $\frac{1}{2}$ -horsepower splash-proof electric motor which may be plugged into any light socket. Known as the Bantam Pump, it measures 9 $\frac{1}{2}$ by 19 inches, and is adapted to the needs of contractors, public utility and municipal maintenance departments, fire departments, factories, plumbers, barge lines, small boat owners, and suburban and summer homes and camps.

Bibb Heat Resistant Cord

Citing the development as an outstanding one in textile manufacture, President William D. Anderson of the Bibb Manufacturing Company, Macon, Ga., recently announced that the company had perfected a heat resistant cord for use in the manufacture of automobile tires. Patents have been issued to Russell B. Newton, superintendent of the Bibb plant at Columbus, Ga.; E. C. Gwaltney, acting agent at Columbus, and Leon A. Graybill, chief technologist, with offices in Macon. The patent for the invention has been assigned to Bibb Manufacturing Company and the cord will be produced in the Bibb mills. Production of the cord marks the culmination of long and intensive research work and laboratory tests by the company under direction of the men to whom the patent was granted.

Two-Plane Conveyor Chain

Known as the Link-Belt Universal Carrier Chain capable of operating in two planes, a new chain announced by Link-Belt Company, Chicago, Ill., is declared to be particularly well suited for handling bottles, jars, cans in process of manufacture, and in cleaning, filling and capping operations. High points of the chain are: that it permits sprocket en-

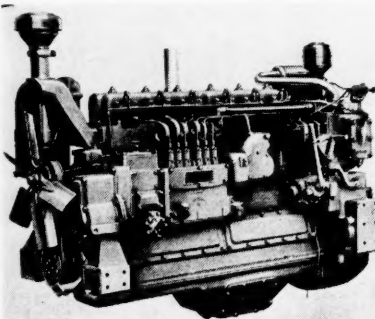


Link-Belt Universal Carrier Chain

gagement in two planes, and that it is accurately made of finished steel to operate over cut-tooth sprocket wheels, resulting in exceptionally smooth conveyor movement.

Augments Diesel Engine Line

Augmenting its line of industrial Diesel engines, Caterpillar Tractor Company, Peoria, Ill., announces a new 6-cylinder, 66-horsepower model, designed as the D4600. Exceptionally smooth running and flexible, the model is declared to be well adapted for use in shovels, draglines and hoists, or connected to a generator as an electric power producer. With a bore and stroke of 4 $\frac{1}{4}$ inches by 5 $\frac{1}{2}$ inches, and turning at 1400 RPM, normal governed speed, the new engine is of the four-stroke-cycle, valve in head, water cooled type featuring solid injection of the fuel



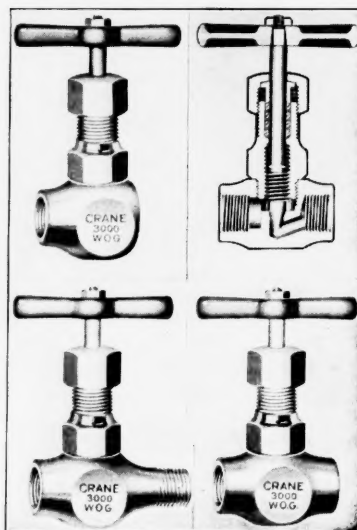
New 6-Cylinder Diesel Engine

into precombustion chambers. In construction work, it will power $\frac{3}{4}$ -yard shovels and draglines. As a source of elec-

tric current, it will be offered as a unit with a 35 KW generator at 50 cycles at 1500 RPM, or as a 32 $\frac{1}{2}$ KW generator at 60 cycles at 1200 RPM. A 14-horsepower two-cylinder gasoline starting engine is mounted at the rear of the Diesel, directly over the flywheel housing, having a governed speed of 3000 RPM. For indoor installation, where atmospheric temperature is more or less constant, electrical starting is available.

Crane Bar Stock Valves

Three new stock valves which find application in nearly every industry have been introduced by Crane Co., Chicago. These small 3000-pound W. O. G. plug type disc, globe and angle valves are called bar stock valves because their

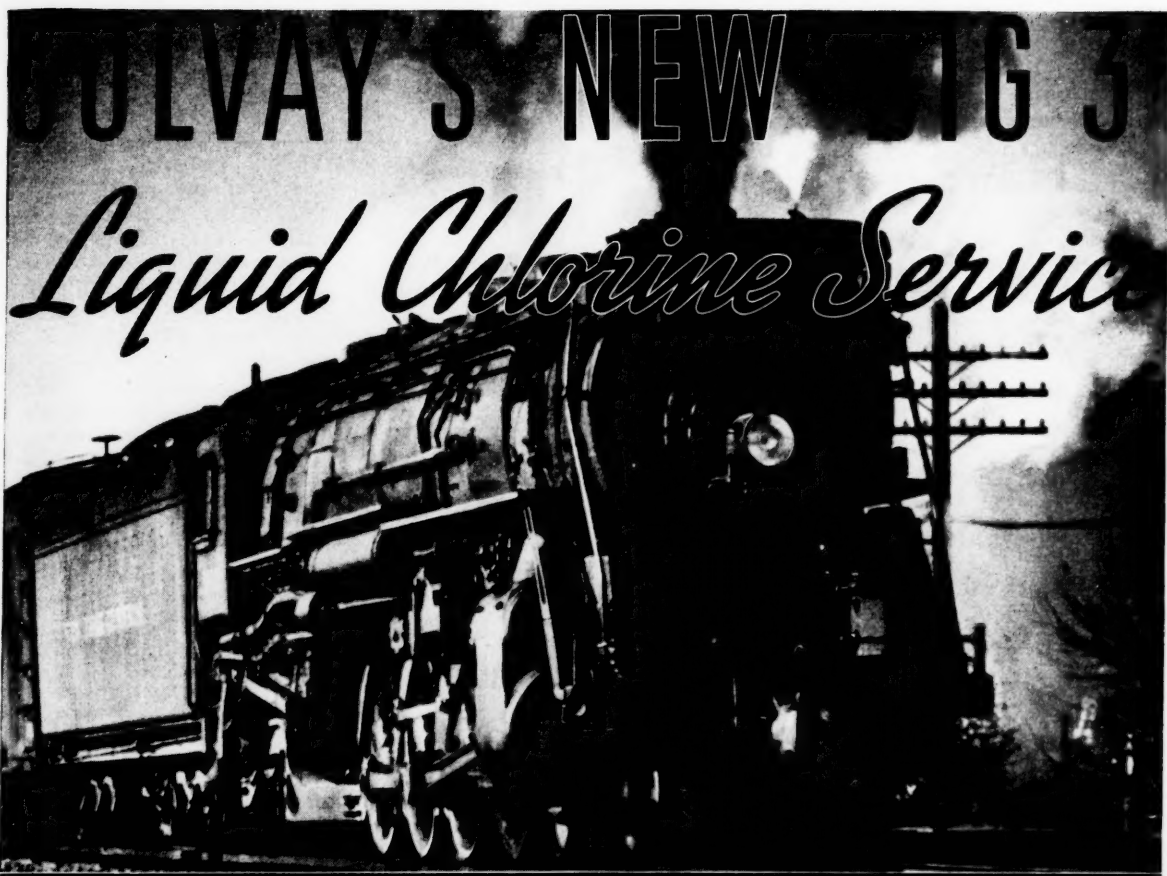


New Crane bar stock valves

bodies and bonnets are made of solid bar stock. They are considered ideal for connections on orifice meters, regulator leads, by-passes, gauges, and for use as expansion valves on ammonia lines and similar service where accurate regulation of flow is desired or where parts of measuring instruments must be protected against the sudden release of high pressures.

Seip Multi-Tray Clarifier

Built on the principle of upward sludge filtration by means of periphery intake channel, a new Seip Multi-Tray Clarifier is announced by Graver Tank and Manufacturing Company, Inc., East Chicago, Ind. Compared with center intake channels, common to most settlers, the intake in the new Seip is ten times as large, it is declared, which reduces proportionately the rate of speed of incoming liquids and results in minimum disturbance to the liquid. The unit is built for hot or cold liquids and is furnished complete with vertical tank and fittings, or may be accommodated to existing tanks.



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...now from Syracuse, N. Y. - Hopewell, Va. - Baton Rouge, La.

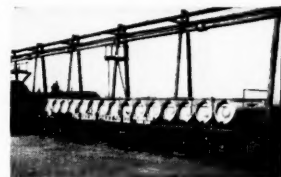
Solvay's new "Big 3" Liquid Chlorine service will prove of definite benefit to state and municipal water works systems and to manufacturers and others who use liquid chlorine. This new Solvay service speeds deliveries to customers at the lowest possible cost, and in the shortest possible time, from *three* important industrial centers—Syracuse, New York; Hopewell, Virginia; and from the *new* producing point at Baton Rouge, Louisiana.

But quick distribution of its liquid chlorine and its alkalis is only the beginning of Solvay's "Big 3" service. Every Solvay facility is extended to make this service the most comprehensive of its kind. Other Solvay depart-



ments, such as its Technical and Engineering Service Department, Traffic and Transportation Division, Distribution and Warehouse Divisions, are constantly seeking out new means to aid customers, to reduce shipping costs and to insure adequate supplies of Solvay Liquid Chlorine and Solvay Alkalies.

Solvay Liquid Chlorine is shipped in single unit tank cars of 30 and 16 tons, in multiple unit tank cars of 15 one ton containers and in 150 and 100 lb. cylinders. Your inquiries as to how Solvay's new "Big 3" Liquid Chlorine Service can be made available to you are cordially solicited. Write for complete details today.



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*TRADE MARK REG. U. S. PAT. OFF.

APRIL NINETEEN THIRTY-EIGHT

47



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SINCE April 17, 1933, A C I has been working hand in hand with producers, sellers, buyers and consumers of the "world's finest bituminous coals" from Kentucky, Tennessee, Virginia and West Virginia.

With this background of five years' experience, we look ahead to our sixth and succeeding years. Through the companies we serve—producers and their sub-agents—we are carrying on to new achievements, making more and more friends for Southern high volatile bituminous coals.

A C I will continue, through engineering facilities, to help producers, sellers, buyers and consumers of coal work cooperatively and collectively to solve their mutual problems.

A C I will continue to bring about a better understanding between buyer and seller of all the factors involved in the successful application and utilization of the coals mined by the A C I producers.

Service of our constituent companies dovetails with Appalachian Service. We are working hand in hand to serve retail coal merchants and users of industrial coals in more than 20 states. Write for your copy of "The A C I Family," a pocket-size booklet listing A C I Agents, A C I Producers, Seams, Districts, etc.

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» » » Finance « « « AND KINDRED SUBJECTS

Reserves Climbing

Excess reserves have grown again to more than one and a half billions, evidencing the increase of idle funds in the hands of banks. In view of the government's announced endeavor to stimulate borrowing, it is doubtful if there will be any further move, for the time being certainly, to set the mark of reserve requirements at a higher figure.

Some have thought that the last increase was not a helpful factor when business declined. People have not been in the mood to borrow and it would be difficult to trace any direct benefit. Most banks have been fully able to accommodate all the loan requirements of their regular customers and have regretted the fact that there was not more demand for money.

United States Savings Bonds

The Treasury Department has announced that savings bonds of the United States Government, totaling more than one and a half billions, have been sold up to the end of the first week in March. They were sold to over one and a quarter million investors since March 1st, 1935. The sales in 1937 were more than 34 per cent greater than 1936, which year exceeded the total of the 10 months of 1935 during which the bonds were on sale by more than 82 per cent.

High Cost of Gasoline Taxes

The American Association of State Highway Officials reports that twenty-five cents of the average dollar spent for gasoline goes to pay for state and federal motor fuel taxes. The actual figures at the service station are 73.35 cents worth of gasoline, taxes 26.65 cents. It works out to a point where duplicating state and federal taxes represent, in effect, a retail sales tax of 35.22 per cent. In one state this sales tax exceeds 65 percent and in several states consumers pay sales taxes of over 45 per cent.

Bank Holding Companies

The major provisions of the bank holding company bill are as follows: (1) Prohibit the formation of any more bank holding companies; (2) forbid existing bank holding companies from acquiring control of more banks; (3) restrain banks controlled by holding companies from opening new branches, making loans to affiliates, or purchasing securities from affiliates; (4) subject bank holding companies and their subsidiaries to periodic investigation by the Federal Deposit Insurance Corporation, with which they would also have to file reports; (5) authorize the FDIC to revoke government insurance on any bank violating any provision of the act.

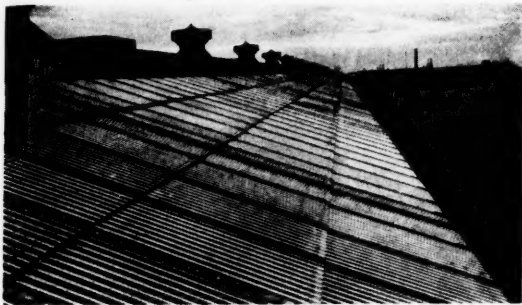
It is claimed that about 50 holding companies now control 500 banks possessing more than one-seventh of all the bank assets of the nation.

Better Feeling

In the decline recently seen in the security market corporation bonds suffered as well as shares. Prices sagged in some cases nearly as much as 20 points and affected industrials in wide variety as well as rails, while government securities showed that sellers were in more evidence than buyers.

In spite of the gloom which has been prevalent in financial markets of the principal cities, it is a noticeable fact that large manufacturers and merchandise houses for some weeks past have felt that business is due soon to turn upward. Inventories

(Continued on page 50)



U. S. Army Base, Brooklyn, N. Y.
30,700 sq. ft. CWG Skylights.

SPECIFY ORIGINAL SOLID CORRUGATED WIRE GLASS

It diffuses light with a minimum of shadows. It is practically self-cleaning and can be used on a roof of any material and supply daylight in manufacturing and industrial plants—an important factor in all modern production.

Also used with excellent results on sidewalls, marquees, canopies and wherever daylight is needed.

Our Engineering Service Department can aid you on your skylighting problems. Write or wire.

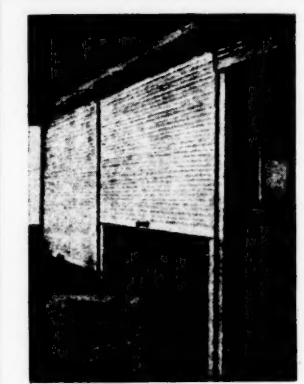
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Write for complete new catalog on Connors Prefabricated Steel Buildings. There is a design and size to meet your individual requirement. Erection is rapid. No waste in time and materials. Minimum cost.

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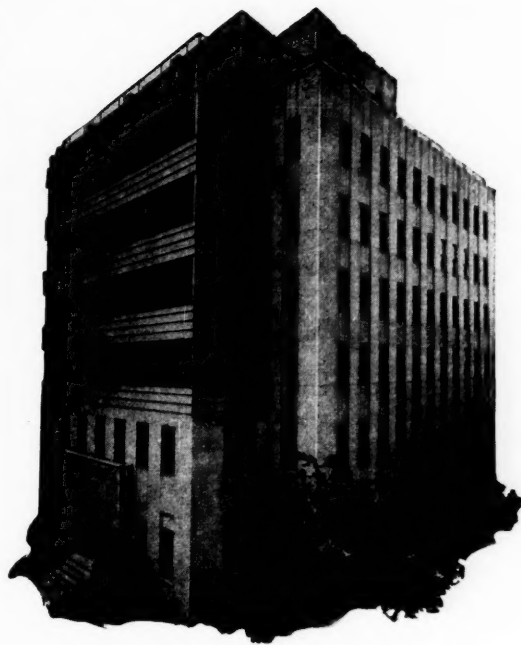


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For all purposes: Wherever Division of Rooms is required. Also

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"Stone Perfect... Finish As Good As When Installed 5 Years Ago..."

That is a quotation from a letter written by Weiss, Dreyfous & Seiferth, architects of New Orleans, referring to the Lapeyre-Miltnerberger Convalescent Home, shown above, which they designed, and on which polished spandrels of Virginia Black Serpentine were used to accentuate the horizontal lines.

As a result of the architects' complete satisfaction with Virginia Black Serpentine, we have just received a contract for this stone to be used in the same manner on the seven million dollar Charity Hospital, New Orleans, also designed by this firm of architects.

We will be glad to send you a set of samples, conveniently boxed, showing the range of stone from the Alberene Quarries in Virginia and to answer inquiries promptly. Virginia Black Serpentine is excellent for interior trim, fireplace facing and hearths, etc., as well as for spandrels, bulkheads, etc. Alberene Stone Corporation of Virginia, 419 Fourth Avenue, New York, N. Y. Quarries and Mills at Schuylar, Va.

Virginia Black SERPENTINE

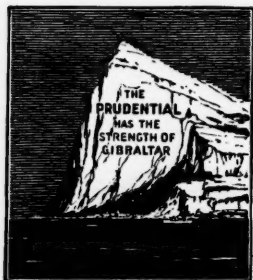
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Management and Staff
join in a worthy cause
when there is

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THE PRUDENTIAL
INSURANCE COMPANY OF AMERICA
EDWARD D. DUFFIELD, President
HOME OFFICE, NEWARK, N. J.

"Finance and Kindred Subjects"

Better Feeling

(Continued from page 48)

are low and as has been frequently pointed out, the demands of the American market are wide and varied. Machinery and material and stocks of goods must be replenished. Congress and certain government officials seem at last to have awakened to the fact that it is time to offer more encouragement to business in order that confidence may grow and activity increase. It is the surest road to the employment of the idle.

Law That Won't Help

If the bill proposed by Senator Wagner, which provides that those who bid for government contracts must obey rulings of the National Labor Relations Board and promise as well to refrain from practices as interpreted by the board as unfair, is passed, it will add to the difficulties of business.

Objections to the Wagner Labor Relations law are largely based on the ground that it is one-sided legislation, recognizes no wrong on the part of labor but on the contrary assumes that all unfair labor practices are on the part of employers. The proposed bill includes in its provisions those who sell to the government as well as firms receiving loans from the government. Thus, another proposed measure of the New Deal offsets and, to a great extent, nullifies suggestions of helpfulness on the part of government.

The RFC has proposed increasing its loans to industry but if the above mentioned bill passes, it will not prove an added incentive for needy business to borrow RFC funds.

Then and Now

In former times of depression when buying fell off, prices were lowered as an inducement to buyers to enter the market. That was in the days when cost of production was largely under the control of the producer.

A meeting in New York recently, sponsored by a large department store, was reported to enthusiastically approve price reduction in merchandise lines. If adopted, increased sales would probably be the effect.

There are deterrent factors in the way of what formerly was regarded as normal business procedure. The producer of raw materials or of manufactured articles is faced with irreducible high figures in his cost sheet. Taxes, for example, take 25 per cent or more of his operating income and he must pay a wage scale probably higher than he has known before. Furthermore, when considering how to reduce costs when the demand slackens, he is faced with "must" legislation in the wage and hour bill which hangs as a pall over the business world.

Railroad Revenues

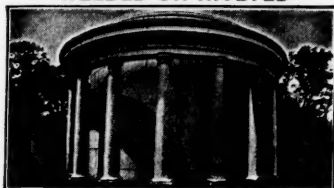
Class One Railroads had estimated operating revenues almost 63 million dollars less in February, 1938, than in February, 1937. Freight revenues were reduced 26.5 per cent in the same comparable period, passenger revenues 4.8 per cent.

The Southern District made a somewhat better showing, operating revenues declining 15.8 per cent below those for the same month in 1937.

Favorable Foreign Trade Balance

The Department of Commerce has reported exports for the month of February totaling \$262,733,000 or 13 per cent greater than those of the same month last year. Imports, on the other hand, were 41 per cent less. Favorable trade balances have kept up since October last.

SOUTHLAND PRODUCTS —WELDED OR RIVETED—



Million gal. Tank at White Sulphur Springs, W. Va.

CHATTANOOGA BOILER & TANK CO.
CHATTANOOGA, TENN.

We now manufacture and offer to the trade tanks in all sizes for pressure or gravity work. Also other steel equipment of either

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This applies to field as well as shop built equipment.

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Our products are designed, built and erected by experienced tank makers.

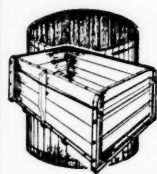
Tanks any size for all purposes.

Towers any height for tanks.

Write for literature and prices.

THE BALTIMORE COOPERAGE TANK & TOWER CO.
Baltimore, Maryland

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DAVIS CYPRESS TANKS

A cypress tank will last indefinitely, and that's the kind we have been making and installing in the South for 50 years. Our experience should mean something to every tank user.

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Made to your specifications of steel, stainless steel, stainless clad, monel, nickel, nickel clad, copper, aluminum and alloy metals.

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From 1/16" to 1" in thickness

Our 25 years of experience in fabricating pressure and non-pressure tanks, smoke stacks, smoke breechings, hoppers, bins, chutes, storage heaters, instantaneous heaters, condensers and kindred equipment is at your command.

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Other Cole products are: Tanks, Towers, Storage Bins, Standpipes, Smokestacks, Flumes, Castings, Nickel-Clad, Stainless Steel and other Alloy Vessels, Air Receivers, Digestors, Boilers, Jig Boxes, Fabricated Steel Work, etc. Write for "Tank Talk" No. 27-D.

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INDUSTRIAL NEWS

Republic Steel Corporation Report

The consolidated net profit of Republic Steel Corporation and subsidiaries for the fiscal year ended December 31, 1937, amounted to \$9,044,147, according to the annual report of the company. Sales and operating revenue for the year reached a total of \$252,443,326, while net sales amounted to \$250,447,743. Deducting manufacturing costs and other expenses, the gross profit was \$42,870,820, and the profit before providing for Federal taxes on income was \$12,382,971. Net profit before adjustment for minority interest was \$9,082,971.

Florida Hosiery Mill Operating

With a complement of 11 machines the Valpariso Hosiery Mill of Valpariso, Florida, has begun operations in a new fire-proof factory building with modern heating and ventilating. When in full operation, the capacity of the plant will be about 12,000 pairs of hose weekly, operating on a 24-hour basis with three 8-hour shifts. It will employ approximately 80 workers. Owners and operators of the plant are William Smith and Joseph Szerbo, formerly of Philadelphia, Pa.

Truscon Installs Bonderizing Plant

As a part of an extensive expansion and development program now under way in Truscon Steel Company, a subsidiary of Republic Steel Corporation, the former has completed the installation at Youngstown, Ohio, of a new Bonderizing plant, consisting of specialized equipment for Bonderizing steel windows, doors, roofdeck sheets and other Truscon steel products. The function of the Bonderizing process is to provide steel with a rust-resisting coating of the proper texture adapted to increasing the adhesion and durability of the paint film applied over it. The Truscon Bonderizing plant is entirely automatic.

Norton Company Replacement Program

Marking a second step in a renovation and replacement program, Norton Company, Worcester, Mass., manufacturers of grinders, will soon begin the construction of a new 4-story building to replace Plant No. 1, 37 years old, and the old office building. The new structure will be 333 by 60 feet, with a total floor area of 100,000 square feet, brick and steel construction, to cost \$263,000. Floors have been designed to carry a live load of 250 pounds per square foot. G. Adolph Johnson is the architect and E. J. Cross Company, general contractor, both of Worcester. Plant No. 3 was replaced by a new building in 1937.

General Motors Diesel Division Appointments

Diesel Engine Division, General Motors Sales Corporation, Cleveland, Ohio, announces the appointment of George T. Mahaney and James D. Platt as Eastern and Western retail sales managers, respectively. Both the new appointees will maintain offices at headquarters of the new Diesel division in Cleveland. Attending school at Sparrow's Point, Md., Mr. Mahaney learned the machinist trade in the shipyards there, graduating later at Gettysburg Academy. He was district manager at Salisbury, Md., for the Chevrolet Motor Division of General Motors, later going to Baltimore in the same capacity, then to the Buffalo zone office as sales promotion manager. Mr. Platt is a graduate of Sheffield Scientific School of Yale University.

Astocrete For Important Construction

The Weber Company, Inc., of Jacksonville, Fla., has secured exclusive rights for the use of Astocrete, a highly refined or "rectified" concrete, in the United States, and has done some outstanding construction jobs with it, in addition to standard concrete materials. Astocrete contains an integral fine aggregate, an inorganic compound—ASTONIT—having an especially prepared base in combination with amorphous silica and mineral oxide ingredients. One of the Weber company's most recent and noteworthy jobs with Astocrete was the construction of a chimney for the National Container Corporation's new pulp and paper mill at Jacksonville, 230 feet by 9 feet, done under the supervision of the Merritt, Chapman and Scott Corporation of New York, general contractors for the plant.

Chemicals in Petroleum Industry

An exhibit depicting the contributions of the chemical manufacturing industry to the petroleum industry will be shown by E. I. du Pont de Nemours and Company, Wilmington, Del., at the International Petroleum Exposition at Tulsa, Okla., May 14-21. The display will occupy 600 square feet in the Oklahoma Building, embracing spaces 159 to 164.

J. A. Fay & Egan Reorganize

Effective March 5, operations of J. A. Fay & Egan Company of (Oakley) Cincinnati, Ohio, manufacturers of woodworking machinery, were taken over by a new Ohio corporation of identically the same name. From January 5, 1937, to March 5, 1938, business of the company was conducted under the direction of trustees appointed by the Federal Court. Early in 1938 the court approved a reorganization plan.

New Republic Steel Jobber

Republic Steel Corporation, Cleveland, Ohio, announces the appointment of W. B. Young Supply Company, Kansas City, Mo., as jobber for Republic's tubular products. Organized 54 years ago, this firm has branches in Hutchinson, Kans., and Joplin, Mo.

(Continued on page 54)



LEADERSHIP FOR OVER FIFTY YEARS

● Ever since the world's first tri-motor electric crane was built in the P&H shops, more than 50 years ago, P&H has continued its leadership as America's largest builder of overhead handling equipment.

When you turn to this group of specialists, you avail yourself of the broadest possible experience in the handling of materials with electric traveling cranes. Offered in all capacities from 5 to 300 tons. Your inquiry will receive every consideration. The Harnischfeger Corporation, 4427 W. National Ave., Milwaukee, Wisconsin.

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BETTER HANDLING AT LOWER COST

Your material handling problems may not be fully solved unless your lift trucks have hydraulic smoothness of operation with precise control. They should also be able to operate with equal speed and exactness through narrow aisles and in close quarters. And they should place each load *exactly* and not *approximately* where you want it. Those features have helped straight gas powered *Towmotors* build themselves a reputation for lower cost per year as well as per ton moved. Perhaps they can do the same for you.

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Stand the Rap!



**With Square Corner
Posts That**

CAN'T BE CLIMBED

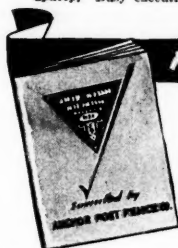
THERE are no straps or rings on the outside of Anchor's SQUARE Corner Posts to give foothold for climbing. Fabric is held to posts by special hooks bolted from the *inside*, and cannot be detached from the outside. Better looks, better protection—an exclusive advantage for Anchor Fence owners.

As permanent as the U-Bar line posts is Anchor's exclusive method of keeping them fast in the ground with deep-driven "anchors." In hard ground or soft... sandy or rocky... frost and thaws, stress and strain won't weaken them. That's why an Anchor Fence won't come loose, won't get out of line.

And to complete the rugged protection of Anchor Fences are ANCHOR GATES. The frames of Anchor Gates are of square tubular steel—for

strength. They are inseparably butt-welded—for rigidity and permanence. Disfiguring diagonal braces are unnecessary; Anchor Gates won't sag, drag or warp. They always swing free and lock tight. Like all the features of Anchor Fences, they can "stand the rap" of time and hard knocks. Anchor Fences are made in many styles for every purpose—industrial, residential and institutional. Nationwide Erecting Service insures efficient installation.

Get This Free Book—Handy 48-page illustrated reference book tells you quickly all you need know about fencing—helps you select the type fences and gates to guard your plant best, look better, last longer, save needless upkeep. Busy executives need this book. Write for your **free** copy today.



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INDUSTRIAL NEWS

(Continued from page 52)

Du Pont Exhibit at Coal Exposition

Designed to demonstrate the significance of modern chemistry to the coal mining industry, an exhibit for the forthcoming Coal Exposition to be held in Cincinnati, Ohio, has been completed by E. I. du Pont de Nemours and Company, Wilmington, Del. It will occupy booths 342, 344 and 346 in the Music Hall area, in addition to the auditorium where the company's Explosives Department will show the film "The Wonder World of Chemistry." The Grasselli Chemicals Department will show the chromated zinc chloride and preserving treatment in its booth, with photo transparencies and special timbers removed from mines.

Bucher is President of Westinghouse

George H. Bucher, executive vice president of Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa., has been elected president of the company, succeeding Frank A. Merrick, who was elected vice chairman. Paul Judson Myler, president of the Canadian Westinghouse Company, was elected a director of Westinghouse Electric and Manufacturing Company.

1937 Outstanding Year For Westinghouse

Notwithstanding the business recession in the latter months of 1937, Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa., reports a 25 per cent increase over 1936 in orders booked. For 1937 the company booked orders to the amount of \$229,540,061, compared with \$182,521,304 for 1936, and exceeding any year except 1929 when booked orders totaled \$240,220,555. Sales billed in 1937 were \$206,348,307, compared with \$154,489,031 in 1936, an increase of 33 per cent, and exceeded only in the year of 1929. Net income in 1937 amounted to \$20,126,408, compared with \$15,099,291 in 1936, an increase of 33 per cent. Unfilled orders of December 31, 1937, amounted to \$60,298,087, an increase of 24 per cent over December 31, 1936.

Parsons in Charge of Jones and Laughlin Sales

Lewis M. Parsons, Manager of Sales at the Philadelphia office of Bethlehem Steel Company, has been named Vice President in Charge of Sales and Director of Jones and Laughlin Steel Corporation, Pittsburgh. In his new position he will have charge of all sales activities of Jones and Laughlin, with district sales offices and warehouses in all sections of the country and in Canada. Southern sales offices are in Atlanta, Dallas, Houston, Memphis, New Orleans, St. Louis and Tulsa, and Southern warehouses in Memphis and New Orleans.

Link-Belt Enlarges Atlanta Plant

To provide for a larger engineering department, more shipping space and additional space for stocks of elevating, conveying and power transmitting machinery, Link-Belt Company, Chicago, Ill., has enlarged its plant at 1116 Murphy avenue, Atlanta, Ga., according to Harold L. Hoefman, general manager of the Atlanta plant. The addition consists of an extension to the north side of the building 20 by 288 feet. All construction is of brick and steel.

TRADE LITERATURE

Rand-McNally Bankers Directory—The first 1938 edition of the Bankers Directory (Blue Book) published by Rand McNally and Company of Chicago, Ill., shows that 148 new banks and branches were opened in the past six months, while 228 banks and branches discontinued business, and 28 changed title or location. There were approximately 186,000 changes in officers and titles. Complete revision of all data in the publication provides an accurate picture of the banking structure today. While the directory is intended especially for the use of bankers, it is also a convenient source of information for commercial and financial houses. This edition is the 124th issue to be published in the past 66 years, and is priced at \$15 per copy.

PEST CONTROL

== SINCE 1860 ==

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Termites
Rodents
Insects

ROSE EXTERMINATOR CO.

St. Paul Pl., Cor. Saratoga St., Balto., Md.
Offices in 14 Principal Cities

CONDENSED STATEMENT SHOWING THE CONDITION OF THE Fidelity & Guaranty Fire Corp. Baltimore, Md.

DECEMBER 31, 1937

Total income during the year	\$1,480,681.48
Total disbursements during the year	3,848,807.55
Total admitted assets	6,601,177.39
Total liabilities except capital	\$4,042,678.13
Capital actually paid up in cash	\$1,000,000.00
Surplus over all liabilities	1,558,499.26
Surplus as to policy holders	2,558,499.26
Total liabilities	\$6,601,177.39
Net premiums in United States December 31, 1937	\$6,466,825.45
Risks written in Maryland during 1937	38,522,560.00
Premiums on Maryland business in 1937	177,526.21
Losses paid in Maryland in 1937	53,831.58
Losses incurred in Maryland in 1937	53,532.58

STATE OF MARYLAND

Office of the

STATE INSURANCE DEPARTMENT

Baltimore, Md., March 1, 1938

I hereby Certify, That the above is a true abstract, taken from the Annual Statement of the FIDELITY AND GUARANTY FIRE CORPORATION, BALTIMORE, MD., for the year ending December 31, 1937, now on file in this Department.

W. S. HANNA,
Insurance Commissioner.

Florida Beach Property For Sale

*Land & Lots
on Anastasia Island
near St. Augustine*

*Town property
at Flagler Beach
Flagler County*

*Investigate the possibilities of Beach
property for development
in Florida*

Model Land Company
Flagler System
St. Augustine, Florida

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WOLMANIZED LUMBER—

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Water Filters for Municipalities, Textile Finishing
Establishments, Rayon Manufacturing Plants, Swim-
ming Pools, Raw Water Ice Plants, Laundries, etc.

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TANKS:	Trailer	Standpipes	Angle Rings
A.S.M.E. Code	Water	Bins Hoppers	Dredge Pipe
Pressure	Process	Stacks	Asphalt Equipment
Truck	Storage	Pipe Coils	Industrial Specialties

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NORFOLK, VA.
Baltimore Rep: Allan U. Bevier, Inc., 322 S. Fremont Ave.

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*Structural Steel for all Industrial Structures,
Buildings and Bridges.*

LARGE STOCK FOR IMMEDIATE SHIPMENT

STRUCTURAL for BUILDINGS STEEL and BRIDGES

Capacity 1000 Tons per Month. 3000 Tons in Stock

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The Largest Steel Fabricators in the Carolinas
Greensboro North Carolina
S. C. Rep., Edward McCrady, 307 Allen Bldg., Greenville, S. C.

HOW TO MAKE PAINT STICK TO GALVANIZED SHEETS

Instantly!



• This snappy-looking truck has a body made of Armco Galvanized PAINTGRIP sheets. The smooth painted surface has gone far and long without evidence of aging or cracking.

The first thing to do is order a supply of Armco Galvanized PAINTGRIP sheets. The next thing is to start painting, because these truly unique sheets need no pre-treatment of any kind. Acid etching or weathering is out.

Armco PAINTGRIP sheets are the product of years of intensive research. The surface is scientifically treated, not only to grip paint immediately, but to hold it.

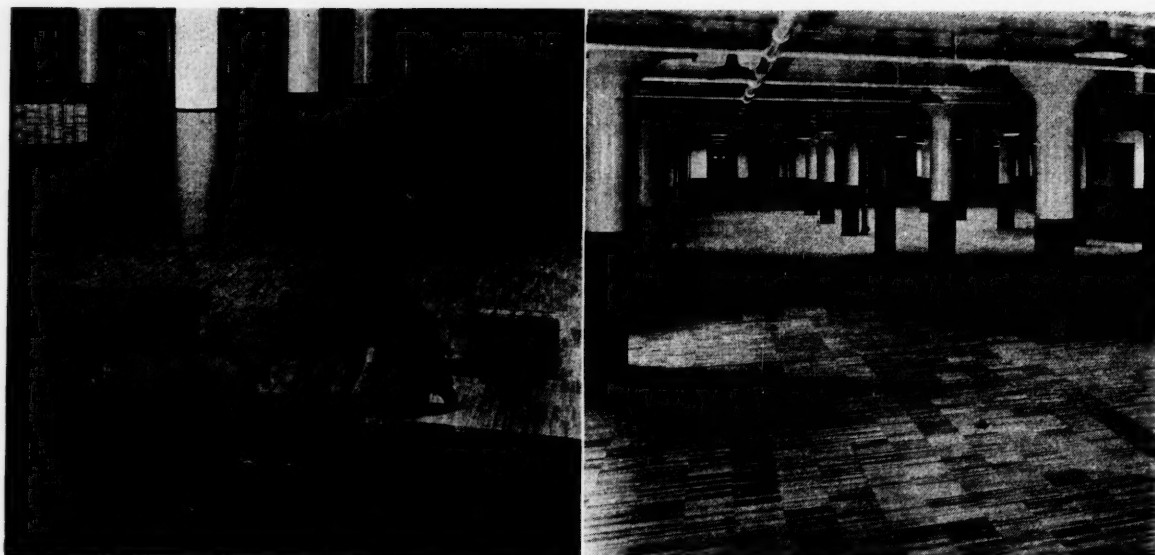
Then the tight PAINTGRIP film insulates the paint from the zinc coating. It helps preserve the essential oils that keep paint elastic, slows down the aging rate, and makes it adhere longer and more protectively. No other sheet can give you this economical advantage.

We welcome questions — in terms of your individual requirements — and we'll answer them to your satisfaction and profit. Ask for our illustrated folder. The American Rolling Mill Co., Executive Offices: 1191 Curtis St., Middletown, Ohio. Branch Offices in All Principal Cities.



Armco

PAINTGRIP SHEETS



Left—Laying the edge grain maple strips in asphalt mastic. Right—The finished floor

Maple Strip Flooring

A NEW type of hardwood floor consisting of edge grain maple strips bound with steel splines has recently been installed in the new addition to the plant of the A. B. Dick Company at Chicago.

The material used was specially milled maple strips, $1\frac{1}{2}$ ins. thick by $1\frac{1}{8}$ ins. wide and 12 ins. long, with square sides manufactured so that the top surface showed the edge grain of the wood, following a custom long used in the installation of bowling alleys where maximum wear under the most difficult conditions is a major consideration.

The method of procedure involved in this installation first necessitated treatment of the concrete base with a coat of asphalt primer. When this was dry the maple strips were set directly in a bed of evenly trowelled asphalt mastic.

The strips were laid in continuous courses across each space, each course being secured to the adjoining one with saw-toothed steel splines, inserted in specially cut grooves in the ends of each maple strip. By the use of steel splines in long lengths, with shorter lengths being used to start alternate courses, the entire floor was bound solidly together. Adequate provision was made at walls and columns for any expansion from climatic conditions and the floor was sanded with electric machines and finished with sealer.

In recent years, wood floors laid in mastic directly on concrete are meeting with more and more favor on the part of architects and engineers. In this new type, laid on edge and bound with steel

splines, the utmost in service and wear is assured. It is a well known fact that the edge grain of wood makes a wearing surface of much longer life and service than will the ordinary flat grain material.

Approximately 85,000 surface feet of maple flooring was laid in this installation, all this space being for manufacturing purposes except about 5,000 feet which is to be set aside for recreational use.

The material, which is available in various thicknesses and sizes, was manufactured by Robbins Flooring Co., Rhineland, Wis., licensed by Manufacturers Block Flooring Corp. Installation was by C. H. Anderson Floor Co., Chicago, from plans and specifications by Nimmmons, Carr and Wright, architects, of Chicago.

Republic Steel's New Mill

(Continued from page 28)

giant 4,500 horse power motors used on the hot mill finishing stands.

The oil lubrication system consists of three individual oil circulating systems in the hot mill and two in the cold mill where there is a total of 73,000 gallons of lubricating oil in circulation at any one time. In addition there are 20 other small oil lubricating systems with a combined capacity of about 8,000 gallons.

Scale which forms on the surface of the slab in the hot mill is forced off at five different stands by a spray of water under a pressure of 1,200 pounds per square inch. Before going to the hot mill sprays, the water is accumulated under pressure in a 40 ton tank with walls four inches thick

made up of three thick plates welded together. The building of this tank was made possible by recent improvements in welding.

There are 26 electrically operated cranes in the mill, the largest being two 75 ton cranes in the hot mill building while to facilitate shipping, there are 11 miles of railroad track in and around the plant.

Revival in Ship Building

(Continued from page 27)

one set of which has a range of 2,000 miles. An alarm system indicates failure of oil supply and burning out of running lights.

Among the accommodations provided for officers and men are the mess rooms, crews' smoking rooms, cold storage, pro-

vision stowage, laundry, and hospital. Non-slip tile is used on floors in gallery and pantries, with magnesite deck covering in all other accommodations. The construction is entirely fire proof. Even doors, furniture and all interior fittings are made either of metal or some other fire-proof material.

Because the ships will operate in warm climates, sufficient ventilation has been provided to insure fifteen complete changes of air every hour in all living quarters and mess rooms.

The ships are built under special survey of the American Bureau of Shipping and in accordance with the latest regulations of the Bureau of Marine Inspection and Navigation. They are suitable for carrying petroleum products through the Panama Canal and the Suez Canal.

LONG LIFE TO LUMBER!

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Built for more years of service—sizes for any diameter pipe from 12 to 84 inches—any length—tongue and groove or bell end.

Makes same sizes pipe as "Heavy Duty" but built to meet demand for lower cost equipment to produce uniform quality in smaller amounts.

Also manufacturers of concrete pipe machines for making pipe by machine process.

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STRUCTURAL STEEL
For Bridges, Buildings and All Industrial Purposes
Steel Plate and Miscellaneous Iron Work
Complete Stock Shapes, Plates, Sheets and Bars for Immediate Shipment
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"SAVE WITH STEEL"

CRUSHED STONE

Only highest grades of crushed
LIMESTONE AND GRANITE
Meeting all specifications

CAPACITY—8000 tons daily

Blue Ridge, Va. Pembroke, Va. Pounding Mill, Va.
Boxley, Greensville County, Va.

W. W. BOXLEY & COMPANY
Boxley Building, ROANOKE, VA.

The Pull of Profit

lures capital to the environment which offers the best opportunity.

The paper industry is being drawn Southward because of a present and future supply of low cost pulp wood. The low cost of pulp wood in the future is made certain because of quick growth in this semi-tropical climate. Logging operations are carried on throughout the entire year, obviating the need of large inventories of wood.

Advances in the art of pulping Southern pine wood within the past few years indicate that finer qualities of paper may soon be made from this material.

There are many favorable locations for new plants. It is an engineering task to determine the best location for any specific mill.

J. E. SIRRINE & COMPANY

Engineers

Greenville

Paper Mills
Water Supply
Reports

South Carolina

Rayon Plants
Power Plants
Bleacheries
Industrial Buildings

Textile Mills
Steam Utilization
Surveys



A Private Forest Enterprise

(Continued from page 30)

pine and 200,000 black locust seedlings will be obtained this year from the 360 pounds of seed that already has been planted. In 1939 it is planned to include in the planting program, sufficient long leaf pine to produce 500,000 seedlings. Water supply and pumping facilities are sufficient to double the present production of the nursery if necessary. However, the present rate is adequate for the present planting program.

In general, the Alabama Power Company program calls for cooperation with

the various agencies of Alabama engaged in forest and wild life conservation and those engaged in soil conserving practice. The Company realizes that the conservation of forest resources is of utmost importance because of its helpful effect in soil erosion control work, flood control, game conservation, recreation and related problems. The increasing demand for lumber, naval stores and pulpwood products indicates a steady and increasing market for forest products. Practical encouragement and education in good forest practices is given to other forest land owners by the company's forester in assisting county agents to arrange meet-

ings for reforestation and soil erosion control, while cooperation with the State Commission of Forestry actively proceeds along similar lines.

Textile Fiber Derived from Milk

(Continued from page 29)

Italian Government for examination and shortly afterwards, commercial production of the fiber was undertaken at the plant of the Snia Viscosa at Cesano Maderno near Milan, Italy.

Though the process of manufacturing Lanital was closely guarded at first and the patent numbers withheld, details may now be obtained from the French patent number 813,427. The principal involved is said to be the same as the conversion of wood into rayon and that the same equipment may be used. The chemical analysis as supplied by the Italian inventor is as follows:

	Natural Wool	Synthetic Wool
	%	%
Carbon	49.25	53.00
Hydrogen	7.57	7.00
Oxygen	23.66	23.00
Nitrogen	15.86	15.50
Sulphur	3.66	0.70
Phosphorus	0.80

It is practically impossible to obtain figures on the cost of production of casein fiber that may be considered applicable in the United States. The total costs should, however, not exceed those of producing viscose rayon. Although casein costs seven to nine cents per pound more than cellulose, carbon disulphide is not required in the casein spinning solution and the costs of conditioning for the casein solution should be somewhat less than for the viscose solution. It may be of interest to state that apart from the casein, the Italian manufacturing cost approximates Lire 1.50 per kilo. (about eleven cents per 2¼ pounds at the time this computation was made in 1936) and about 50 centesimi for the cost of chemicals (slightly less than four cents).

The Casein

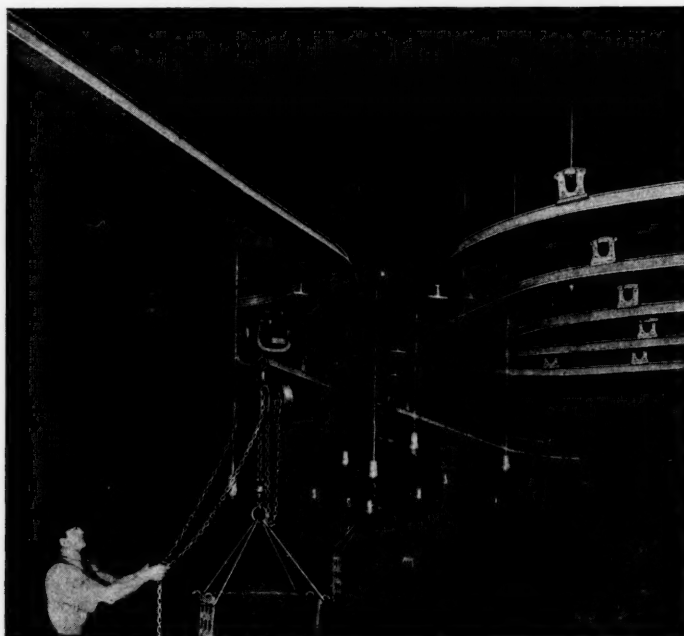
Most of the casein made in this country at present is produced in the States of Vermont, New York, Wisconsin, Idaho, and California. In general, the procedure is to acidify warm skim milk until the casein separates, firm the soft curd either by heating or by further increasing the acidity, wash, press, and dry the casein. The acidification may be accomplished by allowing the skim milk to sour at a favorable temperature, or, more quickly, by adding hydrochloric or sulfuric acids to the skim milk. Acidification beyond that necessary to precipitate the casein, not only causes the casein to become

(Continued on page 64)



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from light loads in the food and textile plants to heavy loads in the metal working industries.



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We have plant and equipment for machining parts, building assemblies, complete units and machines.

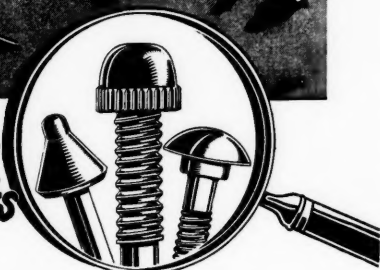
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buyers of made-to-order screws and headed parts are discovering real savings in PROGRESSIVE cold upset products. They have found that many parts now milled from the bar can be headed efficiently and accurately with our modern equipment — at reduced costs. We invite you to submit samples or outline ideas to our specialists. Their advice — intelligently and promptly given — may show you the way to greater fastening economies.



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HERE'S PLEASANT ILLUMINATION
FOR CLOSE DETAIL WORK



THE COMBINATION DOME A MERCURY-INCANDESCENT FIXTURE

● "Now, without harshness, you can use the yellow-green ray of the mercury vapor lamp to show up fine detail with startling clearness. For the Goodrich Combination Dome mixes this yellow-green light with the predominant red rays of the incandescent lamp to produce an over-all illumination under which working conditions are far more comfortable. The ideal fixture where accurate, detail work requires correct illumination. See your electrical supplier or write us for information."

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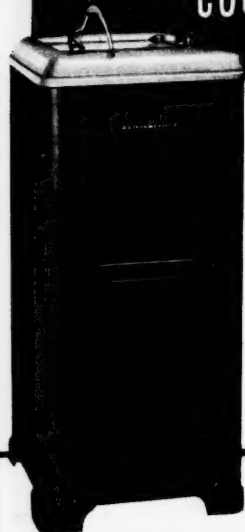
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Please send illustrated literature describing
☐ Halsey Taylor Electric Coolers
☐ Ice Coolers
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By.....
Street.....
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Southern States Industrial Council

(Continued from page 31)

security to be obtained through the years by hard work and thrift, not overnight by the legerdemain of law.

(7) It opposes any governmental invasion into the field of business—it believes in intelligent regulation in the public interest, consistent with the constitutions of the several states and the nation.

(8) It favors the longtime democratic and southern conception of States' Rights, and opposes centralization of power (social, economic, religious, educational and political) in Washington.

(9) It favors fair treatment for labor—reasonable hours, sanitary and safe working conditions, pay commensurate with production—but insists that labor accept its proper responsibilities. It approves the principles of collective bargaining with agencies chosen without coercion from any source, where such agencies are morally and legally reputable and responsible.

(10) It favors the Golden Rule in economics and politics, as well as in religion. It stands squarely on the ancient (and apparently discarded) platform of democracy—"Equal rights to all and special privileges to none."

Such, in brief, are its general views as expressed to date. A word now as to its plans for the future.

Program

(1) Economic questions, for example, the regulation of wages and hours, involve, in addition to constitutional question, an accurate knowledge of facts. Proper wage and hour regulations involve many factors, for instance, living conditions, population, accessibility to both the source of supply of raw materials and consuming markets, available supply of labor, trained and skilled, degree of mechanization, size of industrial units, purchasing power of local communities, taxes, transportation costs, financial status of employers, etc. Complete and accurate facts as to these factors, and other relevant ones, it hopes to accumulate through its research department for the benefit not only of public authority but of employers and employees alike in the South and elsewhere.

(2) Studies seem to clearly indicate that the higher the average educational level, the greater the social needs and wants, and, therefore, the greater general potential purchasing power. With this in mind the Council hopes to cooperate with educational institutions and organizations to increase and broaden educational opportunities in the South.

(3) Recognizing that a sound agricultural system, reasonably profitable financially, is indispensable to national welfare, it hopes to work with farming organiza-

tions to the end, first, that the farmers' purchasing power may be brought to a proper and profitable level—and kept there—and, second, that there may be a reasonable balance between industry and agriculture in all communities.

(4) It hopes to cooperate with all proper agencies to rebuild soil and forest and to protect national resources to the end that future generations may not suffer through present wastefulness.

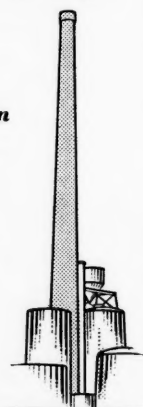
(5) It hopes to interest capital investment in the South for those who come not to exploit but to develop and to live among us in conformity with the general social, religious and political views which once made—and may yet make—the South the hope of representative democracy.

(6) No single trade association or organization is (as far as we know) equipped with factual data or authorized to speak for southern industry and business as a whole. To fill this need is the hope, and will be the endeavor, of the Council.

All those approving in general of the Council's views, and willing to work towards its general objectives, are invited to cooperate—all such will be made welcome; each member, new and old, has, and will have, equal voice in shaping its policies and activities. Its views are not static—they keep pace with the march of events.

Astocrete and **Reinforced Concrete** **CHIMNEY** **CONSTRUCTION**

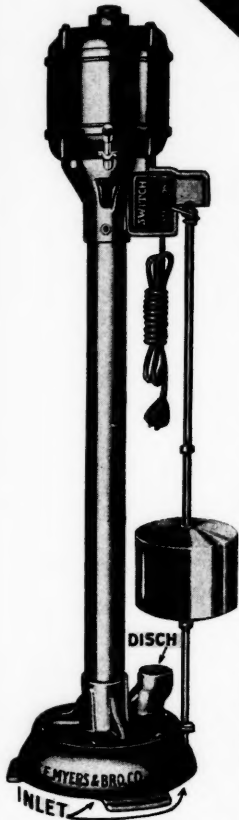
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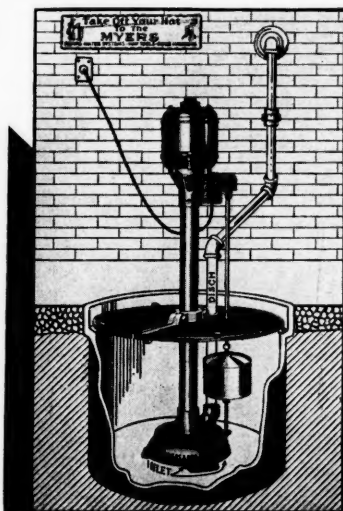
It Drains when it Rains



MYERS CENTRIFUGAL SUMP PUMPS

At the turn of late winter into spring and from then on until summer arrives, flooded cellars and basements are common in most localities. Collectively, loss and damage throughout the country during this period is enormous, so let's not overlook the opportunity Myers Sump Pumps bring to you for profitable business at times like this. More dependable than ever, attractively priced, easy to install and operate, they automatically provide basement or cellar drainage that reduces excessive moisture or flood hazards to a minimum.

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PERFORATED METAL

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BRASS, ZINC, MONEL METAL, STAINLESS
STEEL, ANY METAL, ANY PURPOSE

CHARLES MUNDT & SONS
490 Johnston Ave., JERSEY CITY, N. J.

Tennessee Ceramics

(Continued from page 33)

Evensville for use as furnace linings, and shale is mined at a nearby point in the same county (Rhea County) by a Chattanooga sewer pipe plant.

Kaolins

Limited commercial amounts of pri-

mary kaolin occur in association with the bauxite deposits of East Tennessee, particularly in Hamilton County, and a deposit of possible commercial size occurs near Cleveland, in Bradley County.

A few occurrences of sedimentary kaolin have been noted in Tennessee, principally in the Tertiary and Cretaceous formations of the western part of the

State, but of these only one appears to have commercial possibilities. This latter occurrence, in Carroll County, has not been fully prospected, but recent analyses of samples from this locality have closely approximated those of some North Carolina and Georgia kaolins.

Fuller's Earth

The most recent addition to Tennessee's mineral production has been fuller's earth, used for oil-bleaching purposes. Recent investigations by the writer showed that natural bleaching earths occur in the Porters Creek (Tertiary) formation of West Tennessee, and, in 1937, a mill for processing these clays was established at Paris in Henry County; the product of this mill is shipped to petroleum refineries. Other workable deposits of these clays, up to nearly 100 feet thick, are accessible to transportation at numerous points throughout the outcrop belt which includes parts of Henry, Carroll, Henderson, Madison, Chester, and Hardeman counties.

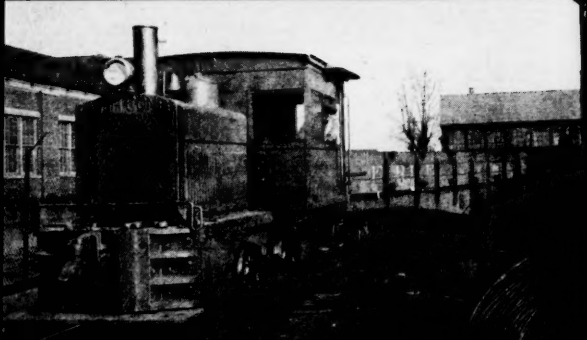
Silica

Geologic horizons in Tennessee that are favorable to the production of silica sands suitable for either glass-making or for processing into potter's flint include the Bonair and Sewanee (Pennsylvania) formations of Cumberland Plateau, the Clinch (Silurian) sandstone of East Tennessee, and, possibly, certain cretaceous or Tertiary sand horizons of West Tennessee; certain river sands, also, are suitable for the cheaper grades of glass. Only one operation in the State is equipped to produce sand of high purity, that being near Sewanee in Franklin County, where sand of more than 99% silica is recovered from the Sewanee formation.

Tripoli is another abundant source of silica in Tennessee that deserves serious consideration as a substitute for some of the present potter's flints. Deposits of tripoli or "soft silica," occur in East Tennessee and in the Western Tennessee River Valley, mainly in Wayne, Decatur, and Perry counties. Ground tripoli is currently produced in Middle Tennessee by two mills in Wayne and Perry counties, respectively. Numerous deposits of Tennessee tripoli will analyze 98 to 99% silica and less than 0.5% iron oxide. This high degree of purity, combined with the pulverulent character of the tripoli, should make it an attractive substitute for flint in certain ceramic processes.

(Continued on page 64)

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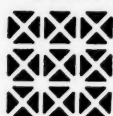
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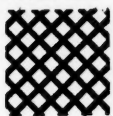
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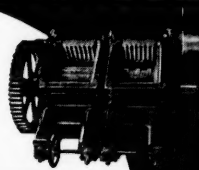


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Tennessee Ceramics

(Continued from page 62)

Feldspar

Although no feldspar is mined in Tennessee, the State annually produces a large tonnage of ground feldspar for the ceramic trades. This production comes from Erwin in northeastern Tennessee; the crude spar being shipped to the mill from North Carolina mines.

Barite

Barite, which finds its way into enamels, glazes, and other ceramic processes, is one of Tennessee's chief non-metallic resources, the State being fourth in national output. Present production comes from the Sweetwater district of East Tennessee and the Pall Mall district in the Northern Highland Rim area. Only crude barite is shipped. Barite has also been mined and prospected in many other counties of East Tennessee, especially in Greene and Cocke counties, and numerous occurrences of this ore are also known in Middle Tennessee.

Bauxite

Bauxite occurs in two widely separated areas of East Tennessee, the bulk of production being from the Missionary Ridge area near Chattanooga; lesser tonnages have been mined from a deposit near Keenburg in the extreme northeast part

of the State. A total of some 350,000 to 400,000 tons of ore has been mined in Tennessee, and current inactivity is due largely to lack of demand and not to exhaustion of the ore deposits.

Tennessee bauxites, which range between 55 and 60% alumina and have relatively high silica contents, are, in general, not suitable for making metallic aluminum, but they have proved satisfactory for making abrasives. Future exhaustion of present sources of diaspore or other high-alumina materials now used in high-grade refractories will doubtless favorably affect Tennessee's bauxite production.

Manganese

Manganese, which has a varied and extensive usage in glass, pottery, tile, brick, porcelain, and other ceramic products, occurs in Tennessee, principally in Johnson, Carter, and Unicoi counties, along the western front of the Smoky Mountains, but other occurrences are known in about 14 additional East Tennessee counties and several counties of Middle Tennessee. Both chemical and metallurgical grades of ore are mined.

Limestone and Dolomite

High-calcium limestones suitable for grinding into ceramic whiting are available in the Upper Mississippian formations exposed in Cumberland Plateau. Some of these are exceptionally pure


limestone, analyzing over 99% calcium carbonate. At Sparta, such limestone is ground into whiting for the rubber and linoleum trades; it is believed that this whiting would prove satisfactory for most ceramic purposes. In addition to these limestones, some of the marbles of East Tennessee have high contents of calcium carbonate and might be adaptable to whiting uses.

Both the "Knox" (Cambro-Ordovician) and Shady (Cambrian) formations of East Tennessee contain beds of dolomites of near theoretical composition (54.3 calcium carbonate and 45.7% magnesium carbonate). The unlimited reserves of these dolomites and the large resources of coal and power in this area could support a considerable chemical or ceramic industry based on these resources.

Textile Fiber Derived from Milk


(Continued from page 58)

granular, but also frees mineral constituents so that they may readily be washed away. Ferretti's patent recommends that casein intended for fiber manufacture be treated at a much higher acid concentration than is the practice for commercial casein in this country. He claims that the higher the acidity at which the casein is treated, the softer and weaker the fiber produced; the lower



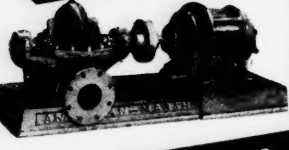
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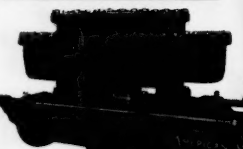
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the acidity, the harsher and stronger the fiber. The Ferretti patent claims that the washed curd may be used without drying; this is feasible, if the casein plant is located near the fiber plant, and would decrease the cost of the fiber.

Although cream may be separated on the farm and butter made there, the making of casein is definitely a factory operation. This implies the daily delivery of milk to the casein plant. Heated vats for the precipitation, presses for squeezing out the bulk of the water, shredders, tunnel driers, and mills for grinding are all required for the process. In order to operate such a plant economically, it should be able to convert at least 25,000 pounds of skim milk per day, and the possible economies increase with the quantity of milk handled.

Casein fiber is practically entirely casein, one pound of casein producing one pound of fiber. The modifying agents added in the manufacturing process add only a negligible quantity to its weight. It has an ultimate composition closely approximating that of wool, the chief

difference being a less sulphur content. Because of this small sulphur content the material takes up much more color than does wool when dyed with acid colors in dilute acid baths. The fiber is faintly yellow in color, has a fine kink, and resembles in appearance a thoroughly washed and carded good Merino wool. Unlike wool fiber, which has a scaly surface, casein fiber is smooth. Consequently, it cannot be felted, but, on the other hand, does not shrink as much as wool. Casein fiber may be made either soft or harsh to the touch. The softer grades have the advantage over wool that the knitted fiber may be worn next to the most delicate skins which cannot tolerate knitted wool. A peculiar feature is that the silkier the finish the weaker the product. Conversely, the harsher the feel the stronger the fiber.

The fineness of casein fiber may be regulated to be constant to any denier, down to three, which is the value for fine wool. Any desired length of staple may be produced. The earlier Lanital was reported to be about $\frac{1}{4}$ to $\frac{1}{6}$ as strong as

wool and its stretch was very slight. It has been claimed more recently that Lanital has a tenacity of 0.85 gr. per denier, compared with 1.00 gr. per denier for wool, and a stretch of 25 to 35 per cent. When wet, casein fiber swells, has greater stretch, and breaks more easily than when dry. In the dyeing process particularly, the fiber becomes very soft and tends to aggregate together due to its comparatively low strength, but when dry it resumes its normal strength.

The conversion of casein to fiber is accomplished by softening the casein in water and dissolving it in a solution of caustic alkali. The viscosity of this solution is carefully adjusted by aging, addition of modifying agents and dilution. The solution is then extruded through multiple spinnerets of the type used in the rayon industry and precipitated and hardened in an acid bath containing formaldehyde and modifiers, or the precipitation and hardening may be brought about in two stages. Subsequent treatments are similar to those used in the manufacture of rayon.

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